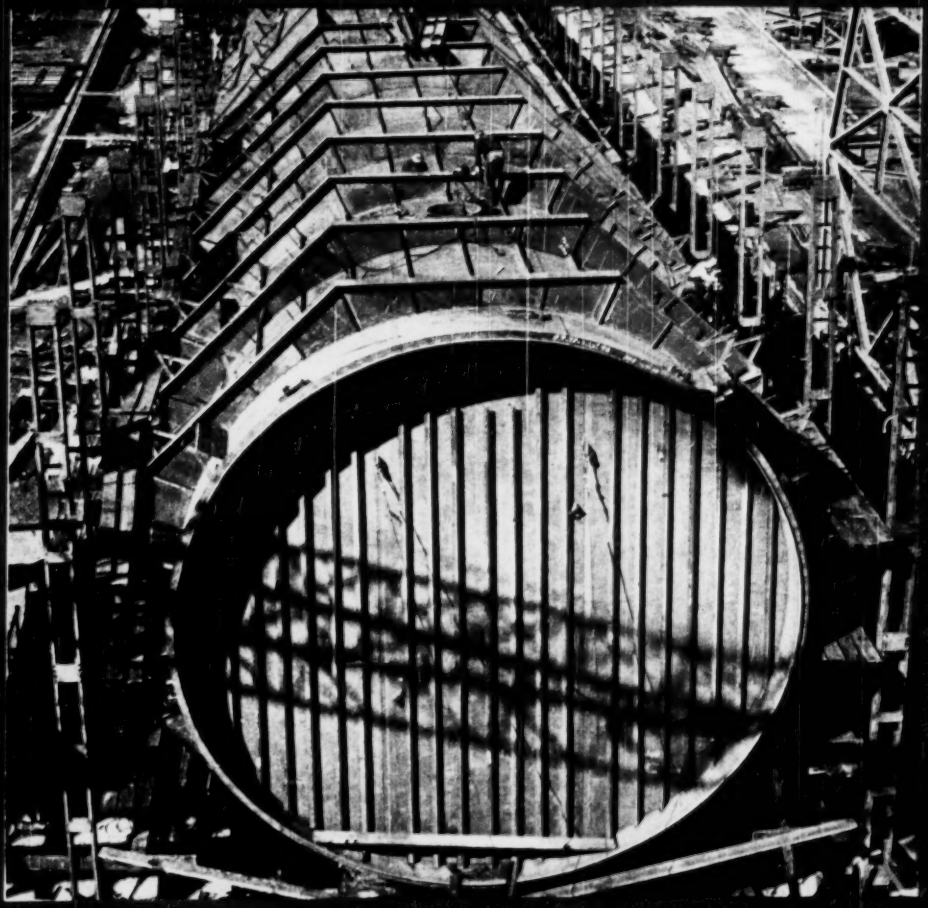
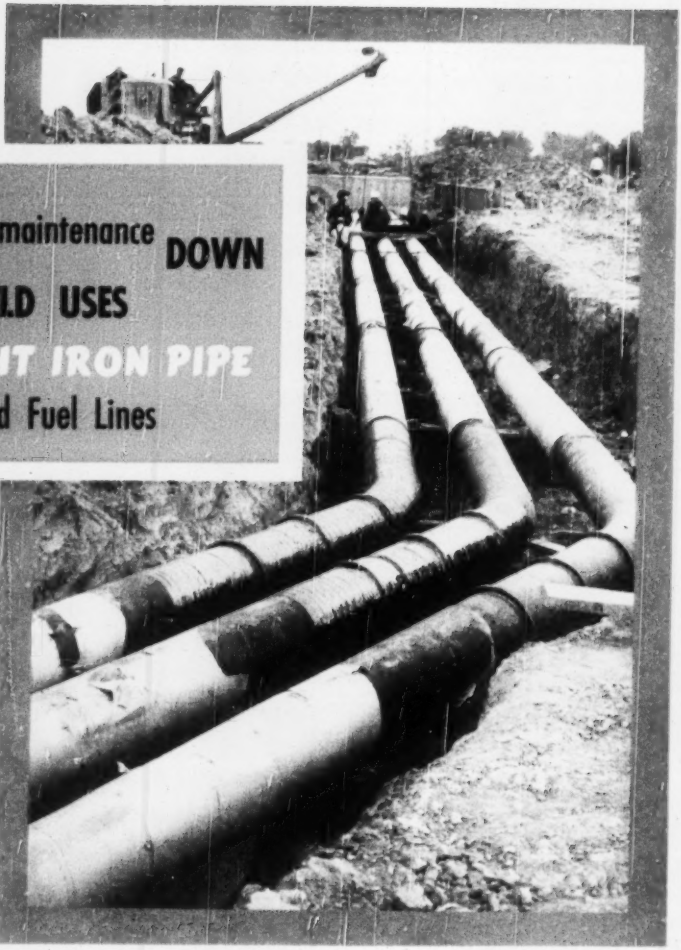
ENGINEERING NEWS-RECORD



A McGRAW-HILL PUBLICATION



To keep planes UP and maintenance DOWN

O'HARE FIELD USES BYERS WROUGHT IRON PIPE for Underground Fuel Lines

These runs of 12-inch Byers Wrought Iron pipe are part of an extensive underground fueling system that brings high-octane gas from a "Tank Farm" to aircraft service islands at O'Hare Field, Chicago. Over three miles of Byers Wrought Iron pipe, in 2, 3, 5 and 12-inch sizes, have been installed in the current project. Plans call for the ultimate installation of over 30 miles of wrought iron line.

Full realization of all the efficiency, safety, and economy possibilities of such an installation naturally demands complete dependability and maximum durability in the piping material. Since some of wrought iron's longest and most impressive records have been made in underground jobs, it was a logical choice for the application.

In one historic instance, a wrought iron line was installed between the Northwest Pennsylvania oil fields and Marcus Hook, near Philadelphia. After 30 years of use, the pipe line company disbanded, and the pipe was dug up, cleaned, and sold for reuse. A 44-mile run of the reclaimed line was installed in Oklahoma, where it served for an additional 14 years—and finally was again resold for other services.

Regardless of the fluids handled, every underground line faces a threat of corrosive attack from the soil. The severity varies widely, but regardless of intensity, wrought iron's extra corrosion resistance provides a valuable extra margin of safety. The tiny fibers of glass-like silicate slag that are threaded through the body of high purity iron halt and disperse corrosive action. The fibers also help to anchor the initial protective scale, which shields the underlying metal—just as a scab protects a wound.

If you are concerned with the installation or maintenance of any underground line, you will find some helpful information in our bulletin WROUGHT IRON FOR UNDERGROUND SERVICES. We will be very happy to send you a complimentary copy, on request.

A. M. Byers Company, Pittsburgh, Pa. Established 1864. Boston, New York, Philadelphia, Washington, Atlanta, Chicago, St. Louis, Houston, Salt Lake City, San Francisco. Export Division: New York, N. Y.

CORROSION COSTS YOU MORE THAN WROUGHT IRON

BYERS

GENUINE WROUGHT IRON

TUBULAR AND HOT ROLLED PRODUCTS

ELECTRIC FURNACE QUALITY ALLOY AND STAINLESS STEEL PRODUCTS

2 ways to Better Air Service

GOODYEAR INDUSTRIAL RUBBER PRODUCTS
-Specified EMERALD CORD AIR HOSE for
ALL HEAVY-DUTY TYPES OF AIR SERVICE
A—Super-tough, non-gouging green cover
B—Reinforcement of high-strength cord impregnated with "Adhezo" for greatest strength, best adhesion, reduced wall gauge
C—Non-porous, seamless, oil-resistant, non-flaking tube
Emerald Cord Air Hose is made with one, two or three braids depending on severity of service—is the finest air hose available anywhere.
GOODYEAR INDUSTRIAL RUBBER PRODUCTS
-Specified REDWING-H CORD AIR HOSE for
MINES, QUARRIES, CONSTRUCTION JOBS
(direct connection to compressors, etc.)
A—Rugged red cover of "cushiony" rubber stock
B—Rayon cord braids for strength and resistance to shock blows
C—Non-porous, seamless, oil-resistant tube will not flake
FOR HOSE, FLAT BELTS, V-BELTS, MOLDED GOODS, PACKING, TANK LINING built to the world's highest standard of quality, phone your nearest Goodyear Industrial Rubber Products Distributor.

FOR the best service at the lowest cost in the long run, ask the G.T.M.—Goodyear Technical Man—for either of these pace-setting hoses. Emerald Cord is the finest air hose made—Redwing-H Cord gives high quality at a lower price. To consult the G.T.M., phone your nearest Goodyear Distributor, or write Goodyear, Akron 16, Ohio.

Emerald Cord, Redwing-H, G.T.M. and The Goodyear Tire & Rubber Company

GOODYEAR

THE GREATEST NAME IN RUBBER

6 hours' work done in 45 minutes

ANYONE CAN USE THE

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JIG COLLIMATOR

famous for

ACCURACY IN ACTION

Jicol

In actual production, the Berger Jig Collimator enables precision alignment in a small fraction of the time normally taken by other methods.

WHEREVER THERE IS NEED FOR PRECISE ALIGNMENT

—in Toolroom, Aircraft Production, Machine Tool Manufacture, Shipbuilding, Construction of Master Jigs, Aligning large Assemblies, and in many other industrial uses...

your plant personnel can use the Berger Jig Collimator readily. No special training is required.

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with detachable striding level

Berger Jig Collimators are used by plants outstanding for their production efficiency, including:

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ENGINEERING NEWS-RECORD

Volume 144 JUNE 8, 1950 No. 23

WALTER G. BOWMAN
Editor

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Number of copies of this issue printed 45,815

Managing Editor ... Associate Editors ... Assistant Editors ... Staff Assistants ... Business News ... Contributing Editor ... Domestic News Bureaus ... Foreign News Bureaus ...

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ENGINEERING NEWS-RECORD

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The STAR PERFORMER on tough jobs!

Your Northwest is a real Rock Shovel! It is designed as a Rock Shovel and it has a combination of advantages for *rock digging* that no other shovel has!

The Northwest Dual Independent Crowd utilizes force most other independent Crowd Shovels waste—result, it handles harder digging and more yards per hour.

The Northwest Welded Boom design is based on scientific tests, combined with the results of performance in the field, not on theory. The Cushion Clutch eliminates shock overloads to all parts under power before damage can occur. Uniform Pressure Swing Clutches take the jerks out of swinging and the "Feather-Touch" Clutch Control takes the back-breaking effort out of operation.

Your Northwest is a Star on the tough jobs—or any job. Where other equipment may be known as "A Good Crane," "A Good Dragline," "A Good Shovel or Pullshovel," Northwest is universally recognized as a leader whether operating as a Shovel, Crane, Dragline or Pullshovel.

You can't have Northwest advantages unless you have a Northwest.

NORTHWEST ENGINEERING COMPANY
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SHOVEL, CRANE, DRAGLINE, PULLSHOVEL OR TRUCK CRANE

WEIGH ALL THE ADVANTAGES

WHETHER SHOVEL, CRANE, DRAGLINE, PULLSHOVEL or TRUCK CRANE
a star on every job!

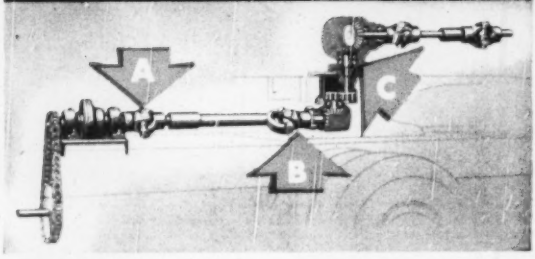
NORTHWEST

CRAWLER and TRUCK MOUNTED SHOVELS • CRANES • DRAGLINES • PULLSHOVELS

NO HOIST HOSES NEEDED* to operate this FRUEHAUF Dump Trailer!

This Fruehauf Dump Trailer is a model YGT5517-21 with 21 cubic yd. capacity body. It is equipped with Gravity-Tandem Suspension.

*It's Equipped to operate with Fruehauf's Patented POWER COUPLER



TROUBLESOME hydraulic hoses are not needed to operate this Dump Trailer. The Fruehauf Power Coupler utilizes the motive power from your tractor to operate the hydraulic cylinder of the Dump Trailer at any time!

And . . . this new idea in power transmission does not limit the use of your tractor to pulling a Dump Trailer! The Power Coupler king-pin is ingeniously constructed for use with Platforms, Carryalls, Vans, Tank-Trailers, etc.

Let your Fruehauf man show you the advantages of the Fruehauf Dump Trailers—and they are many—as well as those of the *Fruehauf Power Coupler*. Coupler driven hoists on Fruehauf Dump Trailers "double-up" on the use of your tractor—permitting you to pull your Trailers in shuttle *without costly, time-consuming change-overs.*

Fruehauf's Power Coupler may be used wherever power transmission is needed between a tractor and Trailer. Diagram above shows how tractor power is transmitted from chain drive through a torque regulator and universal joint to drive shaft (A). A second universal joint and gear assembly (B) transmits power through hollow king-pin (which is strong enough to withstand a direct pull of 115 tons). The bottom king-pin gear (C) transmits power into the Trailer gear box to operate the hoist mechanism.

FRUEHAUF TRAILER COMPANY

DETROIT 32 • LOS ANGELES 11

In Canada: Weston, Ontario

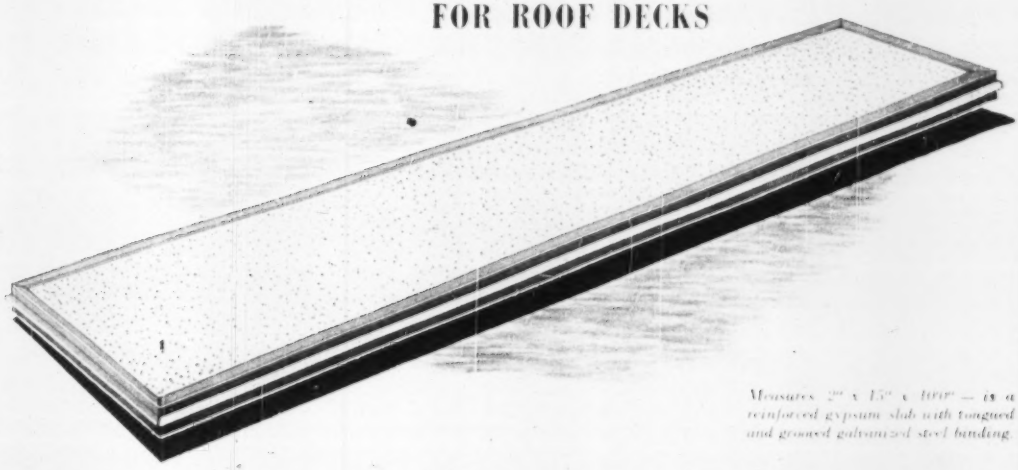
80 Factory Service Branches

FRUEHAUF Trailers

WORLD'S LARGEST BUILDERS OF TRUCK-TRAILERS

Check these 8 ADVANTAGES *of* GYPSTEEL PLANK

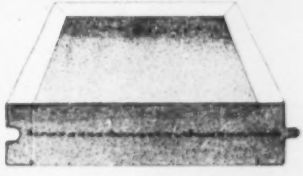
FOR ROOF DECKS



Measures 2" x 15" x 10'0" — is a reinforced gypsum slab with tongued and grooved galvanized steel binding.

- ✓ **FIRE-RESISTANT:** made of gypsum.
- ✓ **INSULATION:** equal to 9 to 10 inches of concrete.
- ✓ **LIGHT IN WEIGHT:** approximately 12 pounds per square foot.
- ✓ **STRONG:** may be used for spans up to a maximum of 7 feet.
- ✓ **ATTRACTIVE FINISH:** exposed under surface requires no additional decoration.
- ✓ **EASILY ERECTED:** no form work, mixing or pouring required; easily sawed, cut or bored.
- ✓ **ECONOMICAL:** keeps erection and labor costs at a minimum.
- ✓ **NO WASTE:** end joints are staggered and need not come over supports. Small pieces may be used to start new rows.

The bindings mesh to form a steel I-Beam that gives Plank its definitely calculable strength and permits the joints to be safely broken between supports. Yet both steel and gypsum are flexible enough to warp or bend within reasonable limits.



The binding is clinched into the gypsum surface. Cross-section shows how steel and gypsum are flush and smooth, presenting a level, uniform surface.

CERTAIN-TEED PRODUCTS CORPORATION
ARDMORE, PENNSYLVANIA

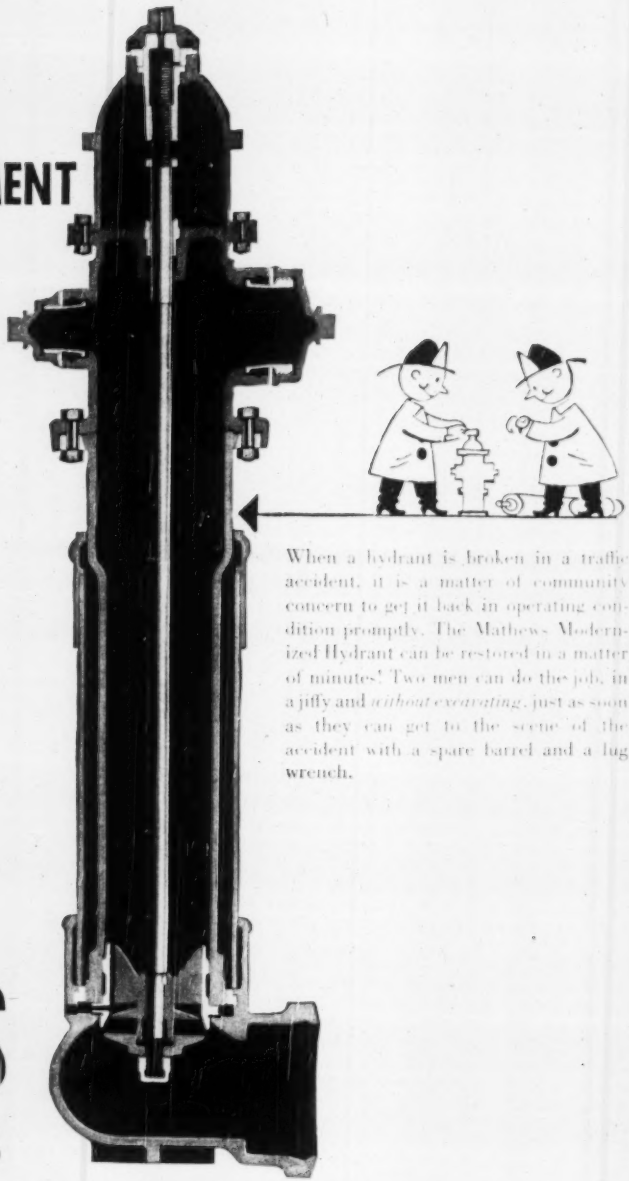
Certain-teed BUILDING PRODUCTS

Certain-teed

Quality made Certain . . . Satisfaction Guaranteed

ASPHALT ROOFING • SHINGLES • SIDINGS • GYPSUM PLASTER • LATH • WALLBOARD • ACOUSTICAL TILE • INSULATION • FIBERBOARD • ROOF DECKS

SPEED OF REPLACEMENT MEANS SAFETY FOR THE COMMUNITY



When a hydrant is broken in a traffic accident, it is a matter of community concern to get it back in operating condition promptly. The Mathews Modernized Hydrant can be restored in a matter of minutes! Two men can do the job, in a jiffy and *without excavating*, just as soon as they can get to the scene of the accident with a spare barrel and a lug wrench.

MATHEWS HYDRANTS

Made by R. D. Wood Company

Public Ledger Building, Independence Square, Philadelphia 5, Pa.

Manufacturers of "Cast Iron" Pipe (centrifugally cast in sand molds) and R. D. Wood Gate Valves

THE FIREMAN'S FRIEND

MATHEWS MODERNIZED HYDRANTS SET THE PACE: Easily maintained because simple in construction • All working parts contained in the replaceable barrel • Stuffing box cast integral with nozzle section • Head can be turned 360° • Replaceable bridal • Nozzle sections easily changed • Nozzle bevel can be turned without excavating • Protection cast on "Small Spun" cast iron for extra strength, toughness, cleanness • Operating thread only part to be lubricated • A modern barrel makes an old Mathews good as new

Barber-Greene

NEW BOOK PRESENTS THE Redi-Fab SERIES

a new, practical, simplified conception of belt conveyors

Select the DRIVE that suits your need
How to Lay Out Your Redi-Fab Conveyor
Redi-Fab Conveyor LAYOUT SHEET
Selection Table
24" BELT WIDTH

Send for Your Copy

Here in this new 40-page catalog Barber-Greene presents the Redi-Fab series of belt conveyors — in a manner that completely unmasks the mysteries of conveyor selection and application.

An entirely new concept of belt conveyor design, the Redi-Fab series enables you to get a belt conveyor quotation almost instantly — and delivery from stock.

And this new 40-page Redi-Fab catalog makes it possible for you to figure your own requirements if you wish. No knowledge of horsepower required. Your Redi-Fab Conveyor, which you can select from this catalog, will automatically have the correct size of drive and motor. In fact, with the new layout sheet in the Redi-Fab catalog you can make your own layout, right down to locating and selecting the "A" frame supports. These are just the high spots — fill in this coupon and get your copy at once.

Use this coupon!

to bring your copy of this new catalog!

Barber Greene Company
Aurora, Illinois, U.S.A.

( ) Send me my copy of the Redi-Fab Catalog.
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BARBER-GREENE
AURORA, ILLINOIS
Constant Flow Equipment

WHERE PIPE LINES ARE CONCERNED...

It's never a lucky break

BELOW—Installing the 30" Lock Joint supply line for Ciudad Trujillo in the Dominican Republic. This line, undamaged by shocks which destroyed many structures in the vicinity, gave unimpaired service throughout the severe earthquake of 1946.

RIGHT—Damage attending the rupture of a large water main in a crowded community.

ONE SLIGHT FLAW IN A PIPE may develop the proportions of a major catastrophe when an important water line ruptures in a crowded area. Utilities can be impaired, property flooded, traffic stalled, business lost, life endangered. A bad break in more ways than one, but a break which could be avoided by using Lock Joint Pressure Pipe.

Lock Joint's water-tight expansion joints built into every section of pipe provide unrestrained flexibility under back loads to accommodate not only normal ground settlement but traffic vibrations and variations in temperature. The high factor of safety assured by its time-tested design of reinforcement provides for every pipe an abundant reserve against water hammer and pressure surges. Experience shows conclusively that Lock Joint Pressure Pipe does not fail.

When planning your next water supply main—specify Lock Joint Concrete Pressure Pipe—the pipe with a proven record of safety.

SCOPE OF SERVICES—Lock Joint Pipe Company specializes in the manufacture and installation of Reinforced Concrete Pressure Pipe for Water Supply and Distribution Mains in a wide range of diameters from 16" up as well as Concrete Pipe of all types for Sanitary Sewers, Storm Drains, Culverts and Subaqueous Lines.

LOCK JOINT PIPE COMPANY

Est. 1905

P.O. Box 269, East Orange, N. J.

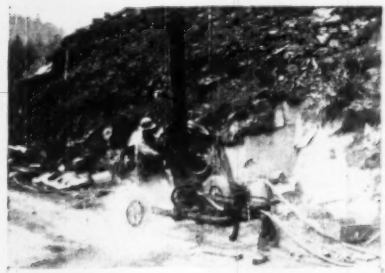
PRESSURE PIPE PLANTS: Wharton, N. J. • Tampa, Fla. • Detroit, Mich.

BRANCH OFFICES: Casper, Wyo. • Cheyenne, Wyo. • Denver, Col. Kansas City, Mo. • Valley Park, Mo. • Chicago, Ill. • Rock Island, Ill. Wichita, Kan. • Kenilworth, N. J. • Hartford, Conn. • Tucumcari, N. Mex. Oklahoma City, Okla. • Tulsa, Okla.

LOCK JOINT
Reinforced Concrete
PRESSURE PIPE

You hear it from coast to coast.*..

"It's Blue Brutes For My Money!"



***OREGON**

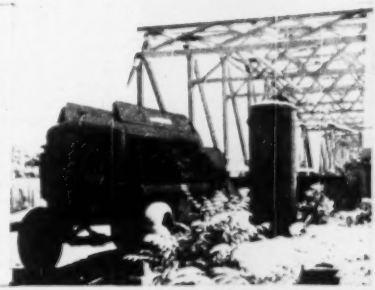
It's another Blue Brute UMW Wagon Drill. Ready to swing into action at any angle, it is here helping to cut through a road cut where the timber grows tallest. The Kuckenberg Construction Company of Portland, Ore., are the owners and the report from this firm says they **"wish all their other machines on the job were as good . . . and are going to change to Blue Brutes in future replacements."**

***PENNSYLVANIA**

A 315' Portable Compressor and UMW Wagon Drill, one of many Blue Brute teams owned by Cramer Construction Co. of Lebanon, Pa. Pres. G. B. Cramer writes: **"We have used Blue Brutes for several years, and on our Lebanon Veterans' Hospital job have five Blue Brute Compressors powering Worthington Wagon Drills and Rock Hammers. As evidence of their entirely satisfactory performance we recently purchased another 315' Blue Brute Compressor."**

***OHIO**

In Waterville, Ohio, the Crawford Steel Construction Co., Inc., of Cincinnati, erected the structural steel on the new highway bridge across the Maumee River. Company official J. A. Crawford says: **"Our 210' Blue Brute Compressor is efficient, well constructed and rugged. It has given us excellent service, and we are more than willing to recommend it highly . . . This first experience with your products is evidence to us of Blue Brutes' superiority.**



***WISCONSIN**

Opening up a new limestone quarry in Sussex, Wisconsin, is easy work for these rugged, hard-hitting Blue Brute team-mates. The fast, versatile UMW Wagon Drill is drilling 6-foot holes for explosive charges. Power source is a 315' Blue Brute Compressor, that gets all the air out of every drop of fuel. Vice-President Lloyd Wolf of the Quality Limestone Corporation, reports: **"After thorough investigation we decided Worthington equipment was best . . . They are fine machines."**

From the Atlantic to the Pacific you'll find Blue Brute owners — on every type of construction project, from the smallest to the largest — glad to tell you of the cost-cutting, trouble-free performance that is helping make estimates pay handsomely.

There are a lot of sound reasons for this country-wide acclaim — all adding up to the fact that *there's more worth in Worthington*. Your nearby Worthington-Blue Brute Distributor is ready with those reasons, and can make immediate deliveries. See him, or write us direct.

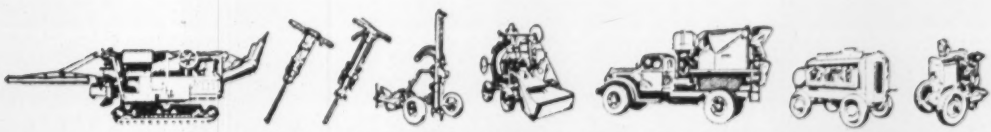
Worthington Pump and Machinery Corporation
Construction Equipment Department
Harrison, New Jersey

Distributors In All Principal Cities

WORTHINGTON

HO.5

BUY BLUE BRUTES



IF IT'S A CONSTRUCTION JOB, IT'S A BLUE BRUTE JOB

4 NEW Rubber-Tire Lorain "TL's" with 50% MORE Lifting Capacity

Bigger and *better* — there's a short 3 word description of Thew-Lorain's latest developments in the field of rubber-tire cranes, shovels, draglines, clamshells, hoes, . . . The new, heavy-duty 3 4 yd. Lorain TL-25 turntable is now available mounted on a series of new, longer and heavier 6 wheel carriers . . . The resulting machines will lift 15 tons — 50% more than previous "TL" models . . . These machines are offered you in 2-engine Moto-Cranes and single-engine Self-Propelled machines in the following models.

Model	Moto-Cranes	Self-Propelled
Standard Track Carriers	Model MC-254	Model SP-254
Wide Track Carriers that greatly increase lifting capacity "on rubber"	Model MC-254W	Model SP-254W

ADD THESE NEW FEATURES TO PROVED "TL" RUBBER-TIRE PERFORMANCE

1. New 15 ton lifting capacity.
2. New, longer, heavy-duty TL-25 turntable.
3. New pin-connected crane boom — more capacity and more reach.
4. New, longer specially designed shovel-crane carrier.
5. Bigger tires for better soft-ground flotation.
6. Front wheel drive available on Standard Track Carrier.
7. Wide Track models available for maximum "on rubber" lifting capacities.
8. Full convertibility to crane, shovel, dragline, hoe, clamshell booms with equal efficiency.

Get the facts on the *Biggest* and *Best* in rubber by calling your Thew-Lorain distributor.

THE THEW SHOVEL CO.
LORAIN, OHIO

MORE SELECTION in the Thew Lorain TL SERIES on RUBBER

THEW LORAIN®

SHOVELS • CRANES • CLAMSHELLS • DRAGLINES
HOES • MOTO-CRANES

SEE YOUR *THEW-LORAIN* DISTRIBUTOR FOR ALL THE FACTS

NEWS BRIEFS

Expensive, No?—It'll cost somewhat more than $1,000 per foot to build the second section of Toronto's Yonge Street subway (bids approximately $7,000,000; length 6,764 ft). But Canadians are gratified that an all-Canadian organization will do the job. First section is being built by a combination U. S.-Canadian firm.

Inexpensive, Yes?—Massachusetts legislators have been told, in effect, that they can't afford not to build a $20,000,000 wholesale market for Boston. The cost, proponents argue, could be amortized by elimination of annual spoilage losses running from $4,000,000 to $6,000,000.

Better Late . . .—Federal Bureau of Mines figures it can extinguish a 25-year-old coal seam fire near Fecht, Wyo., by blanketing the entire area under a 10-ft layer of compacted earth and rock. It'll take about 210,000 cu yd of fill. The fire has consumed an estimated 500,000 tons of coal.

Save it for the Russians—Four West Virginia lads wound up in the pokey after they damaged four bulldozers in the course of a make-believe tank battle. Harmon Brothers Co., of Gratton, West Virginia, estimated damage to its machines at "about $2,000—bent frames, stripped gears and burned-out bearings."

It's a Fact—After long, complicated delay, Ohio's Turnpike Commission has picked the J. E. Greiner Co., Baltimore consultants, to make engineering surveys of the proposed Ohio Turnpike. Cost will be $267,500. Parsons, Brinckerhoff, Hall and Macdonald, New York, will make the traffic and revenue studies, at $70,000.

Wanted: Bridges—Louisiana legislators are considering a bill to establish a state bridge authority comparable to those which exist in New York, California, New Jersey and Pennsylvania. It wants to be able to build structures needed now without having to rely on the limited financing possibilities of state-backed bond issues or fix toll rates.

Watch It, Men—Federal Housing Administrator J. D. Richards has emphasized that contractors on FHA-multi-family housing projects must be cautioned to "observe not only the agency's prevailing wage requirements, FHA will withhold mortgage of future

Continued on page 12

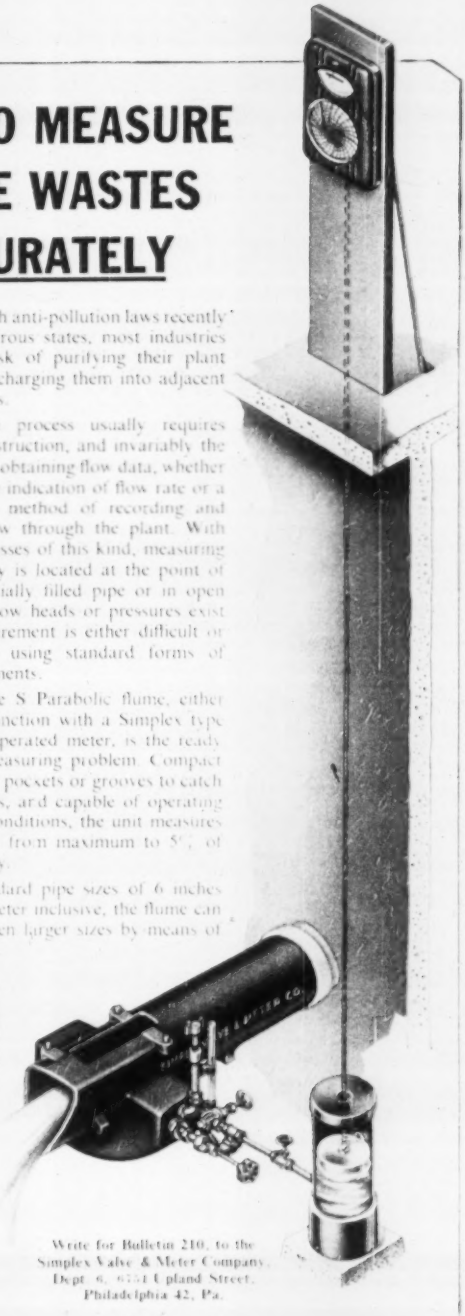
HOW TO MEASURE TRADE WASTES ACCURATELY

In accordance with anti-pollution laws recently enacted by numerous states, most industries now face the task of purifying their plant wastes before discharging them into adjacent streams and rivers.

This purification process usually requires special plant construction, and invariably the necessity exists of obtaining flow data, whether this be the simple indication of flow rate or a more permanent method of recording and totalizing the flow through the plant. With purification processes of this kind, measuring equipment usually is located at the point of discharge of partially filled pipe or in open channels, where low heads or pressures exist and where measurement is either difficult or impossible when using standard forms of measuring instruments.

The Simplex type S Parabolic flume, either alone or in conjunction with a Simplex type HF water float operated meter, is the ready answer to this measuring problem. Compact in design, with no pockets or grooves to catch sediment or solids, and capable of operating under low flow conditions, the unit measures over long ranges, from maximum to 5% of maximum capacity.

Available in standard pipe sizes of 6 inches to 36 inches diameter inclusive, the flume can be attached to even larger sizes by means of eccentric reducers.



Write for Bulletin 210, to the Simplex Valve & Meter Company, Dept. 6, 6751 Upland Street, Philadelphia 42, Pa.

SIMPLEX

VALVE AND METER COMPANY

Simple Arithmetic IN DREDGING!

If you want the best light-weight pipe for dredging service, just make this simple addition to your equipment.

add:

SHORE PIPE
+ PONTOON PIPE
+ INTAKE PIPE
+ DISCHARGE PIPE
+ SAND AND GRAVEL CONVEYING LINES

The Answer is... NAYLOR PIPE

The proving factor is Naylor's exclusive reinforcing truss formed by the Lock-seam Spiral-weld structure which makes Naylor Pipe stronger, safer . . . superior to ordinary light-weight pipe in this service.

Sizes from 4" to 30" in diameter with all types of dredging fittings and connections.

NAYLOR PIPE COMPANY
1248 East 92nd Street, Chicago 19, Illinois
New York Office: 350 Madison Avenue, New York 17, N. Y.

(Continued from page 11)

advances if it can demonstrate past failure to observe the regulations.

You Can't Do That—Pomona, Calif., city councilmen met a barrage of legal opinions when they enacted an ordinance forbidding themselves from approving any state highway route through their city other than a specified northern route. The State Highway Commission, armed with opinions that such an ordinance was unconstitutional, pushed through its plan for a southern route.

The Merchandising Influence—A. B. Cole, Meshoppen, Pa., contractor, was low bidder on a highway job in Luzerne County (Scranton). His bid, for 1.88 mi, was $93,999.99.

Happy Motoring—North Carolina, having got its $200 million rural road program nicely underway, isn't going to forget its primary system. Highway Commission Chairman Henry Jordan says the state will undertake a study for a long range program to modernize its system. There's $30,000 available for it. Meanwhile, James S. Burch, statistics and planning engineer for the Highway Department, says that at least 500 mi of the primary system need widening if they are to meet existing traffic needs.

Same Old Tussle—Louisiana's Highway Department is the latest to become embroiled in the old bridge versus-channel argument, this one centering around a proposed bridge across the Harvey canal from Avondale to Algiers. Most of the 25 objectors to the proposed structure don't think its 50-ft clearance is sufficient.

Lo, the Poor Taxpayer—A West Virginia judge has upheld Morgantown's ordinance which permits city streets to be blick-topped at the expense of abutting property owners.

MAJOR MEETINGS

Western Association of State Highway Officials, Mayne Hotel, Boise, June 5-8.

Pennsylvania Sewage Works School, [illegible], June 5-9.

American Congress on Surveying and Mapping, 19th annual meeting, Hotel Shoreham, Washington, D. C., June 6-9.

Pennsylvania Water Works School, [illegible], June 5-9.

Ohio Sewage & Industrial Wastes Treatment Conference, Hotel [illegible], June 7-8.

American Society of Civil Engineers, [illegible], June 12-16.

FASTER PAVING... LOWER COSTS with GM DIESEL POWER

ON 22 miles of U. S. Route 81 in Kansas, these two GM Diesel-powered Koehring 34-E Twinbatch pavers were used by Koss Construction Company of Des Moines. They poured 2800 feet of 22-foot pavement in one 10-hour run. Slab was uniform 9-inch thickness, mesh reinforced.

In another period of 4 consecutive days, their crews paved 2 full miles. They completed the entire 285,000-sq.-yd., 22-mile paving project in 12 calendar weeks.

Records show these crews consistently poured 1000 batches per 10-hour day—a tribute to the men, the equipment and the power.

Because General Motors Diesels are 2-cycle engines, they deliver power at every piston downstroke. So the power flow is smoother and acceleration is faster under load. The engines are more compact, easier and more economical to maintain.

No matter what kind of work you do, if you want sturdy, dependable, money-making power, it will pay you to specify General Motors Series 71 Diesel engines for new equipment or for repowering old.

Kansas Lowest in Concrete Pavement Construction Costs

A recent study released by the Bureau of Public Roads reveals wide differences in the cost of building concrete pavement.

Kansas, Texas and Michigan costs were lowest. Because of the difference in thickness of pavements in various parts of the nation, the comparison of construction costs was made on the basis of a square yard one inch in thickness.

The cost varied from 36.1c per sq. yd. 1 in. in thickness in Kansas to $1.076 in Nevada. Michigan's cost was 36.8c. The national average cost is 42.1c. In Illinois the cost is 48c; Ohio 44.7; Pennsylvania 51c; Indiana 45.3c; Wisconsin 43.6c; and Kentucky 56.2c.

Reprint from—
ROADS AND STREETS
February, 1950

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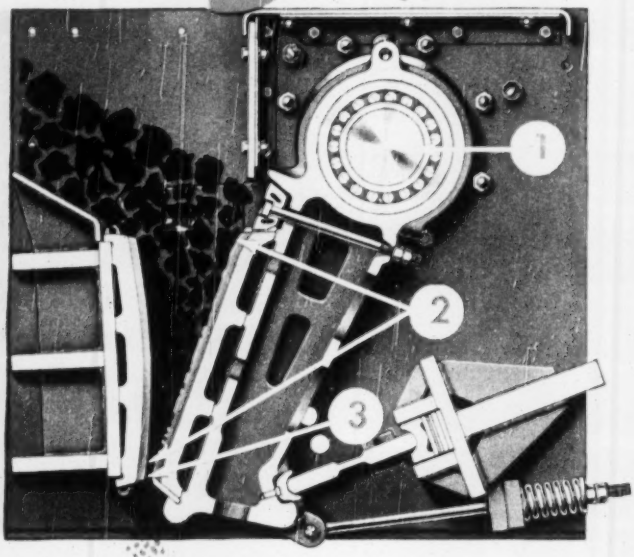

to put the maximum amount of rock through a jaw crusher

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. . . and that's one big reason for the uninterrupted flow of material through the crushers and over the screens and conveyors of Austin-Western portable plants. No bottlenecks . . . no delays . . . just constant, high speed production.

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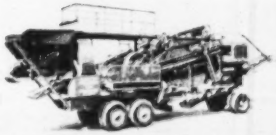

"201"—High output, portable gravel plant capable of producing especially large amounts of ¾" and smaller product.

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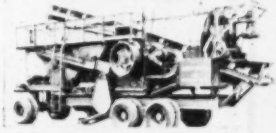

"101"—For contractors or counties needing extra large amounts of material. Equally useful in gravel and quarry service.

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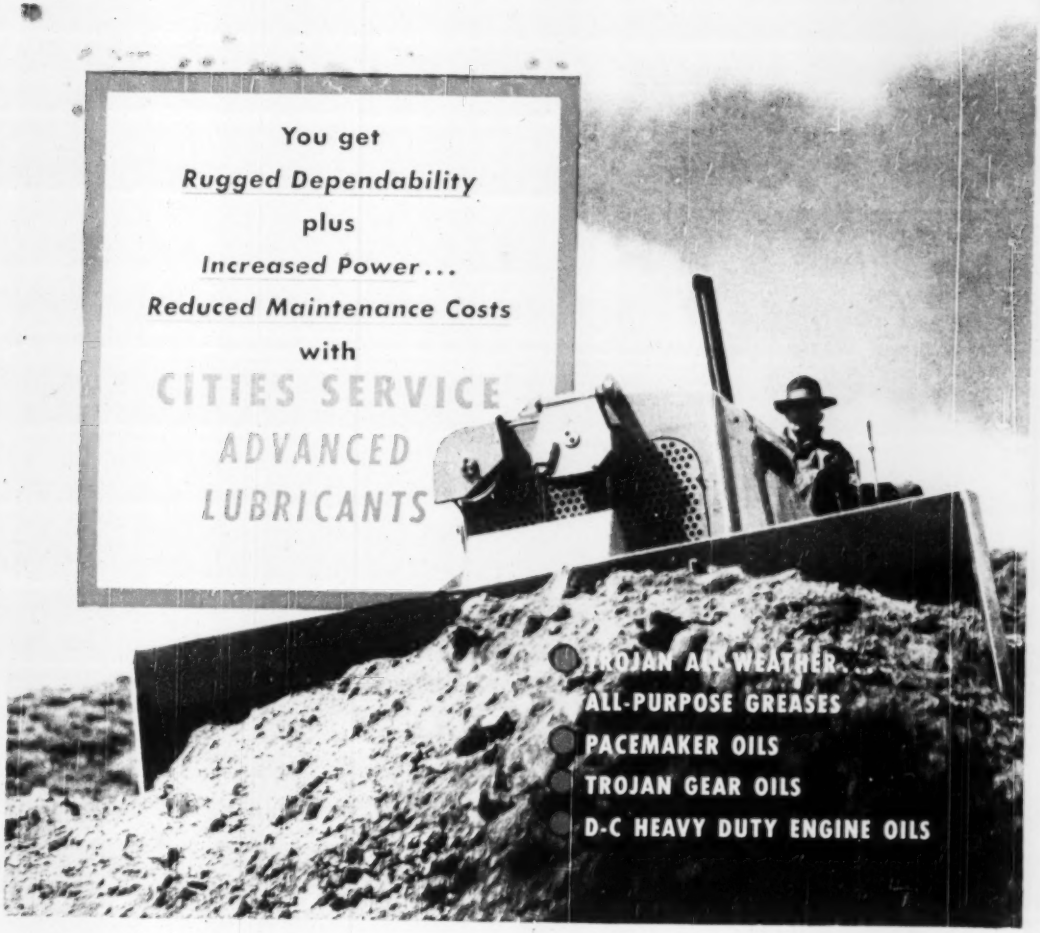

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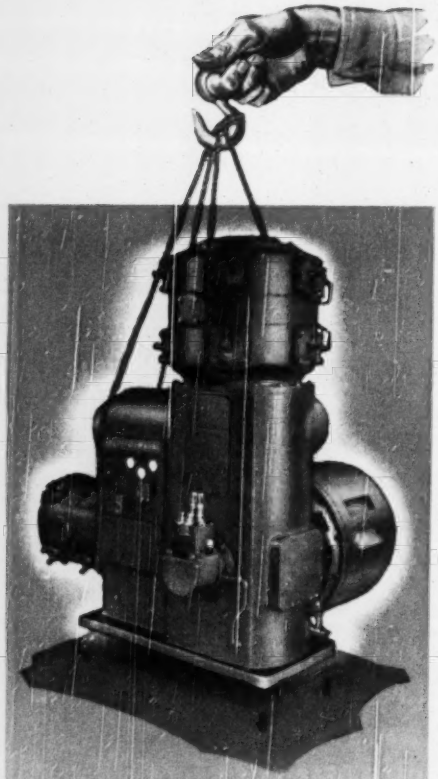

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9. **Wide range of sizes** . . . 125, 150, 200, 250, 300, 350 horsepower for 80-125 psi discharge pressures.

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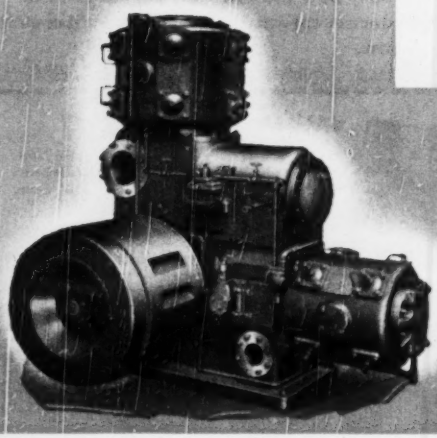

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THE CONSTRUCTION WEEK

POOR BUSINESS?—Chicago area contractors rank way down—60th among 70 business fields—in percentage of profit. At that rate, G. C. Kiddoo, vice-president of the First National Bank of Chicago, told the Chicago chapter of the AGC, contractors might well put their money into securities and go fishing.

GOOD BUSINESS?—Washington will pour forth plenty of optimism on business prospects this month and next, say close observers of the President's Council of Economic Advisers. Outlook for the second half of 1950 is continuing on an uptrend that is expected to bring the year's totals above 1949 figures. Credit is to be assigned President Truman for, among other things, helping along the home-building boom.

FILE AND FORGET DEPT.—Los Angeles—which thought it might have found a source of additional revenue—has tabled the idea of returning to the old method of assessing the municipal Department of Water and Power on the basis of taxation as a privately owned utility. At present, the utility pays 5% of gross income not to exceed the last computed earned surplus figure. Investigation showed the utility paid $3,572,000 to the city. Although under the tax and franchise fee arrangement it would have paid $4,105,331, city councilmen decided the difference wouldn't warrant the change.

UNEMPLOYMENT DOWN—The Department of Labor, which a year ago saw a gloomy picture of rising unemployment, saw brighter tints last week. The department, in fact, looks for a 60,000,000-worker force by summer.

NEVER DO TODAY. . .—No administration proposal to merge the civil functions of the Corps of Engineers (flood control and rivers and harbors work) with the resource development agencies of the Interior Department (more specifically, the Reclamation Bureau) will go to Congress this year. President Truman, who supports such a merger, wants too many other things from the existing Congress to risk sending so controversial an issue to the Hill this summer. But the way things stand now, such a proposal definitely will be sent to the Eighty-Second Congress early next year. Insiders say the precise details of the plan just aren't to be had right now. But they add that it's the Engineers who'll suffer, not Interior. And the Hoover Commission proposal for an independent Board of Engineering Review is to be included in the new set-up. Despite any changes this fall's elections may make in the forth-coming Congress, it's a pretty safe guess that there'll be some violent opposition awaiting the proposal when it reaches the Hill next year.

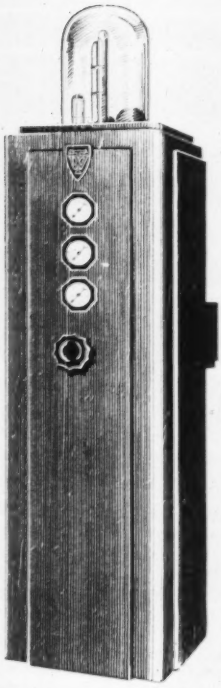
FLOOD READINESS—Reclamation Bureau has a long string of reservoirs—from Wyoming west—ready for whatever major flood threats may develop in the Columbia River watershed this season. Cooperating with the Corps of Engineers and the Bonneville Power Administration, USBR already has drawn down Grand Coulee reservoir by 900,000 acre-ft, will release 375,000 acre-ft more. This could cut 1.4 ft off the stream's crest at Vancouver if the timing works out precisely. Elsewhere, on Columbia tributaries, there are 330,000 acre-ft available now in the Yakima reservoir and 220,000 acre-ft more to be had at American Falls, on the Snake. Jackson Lake, high in the Wyoming mountains (origin of the Snake) Cascade, Deadwood, Anderson Ranch and Arrowrock Reservoirs, on the Snake or its tributaries, have 930,000 more acre-ft of available storage. All this storage space could cut the Columbia crest, if the filling of the reservoirs and the incidence of the crest can be timed correctly.

METER MIXUP—Milwaukee, which uses water meters as an effective tool to cut water wastage, found suddenly that all wasn't too well with the scheme. Two city aldermen discovered there is a waste—of constituents' money. Works like this: To replace a water meter, you must employ a master plumber. He turns in your application at City Hall. The city puts in the meter—either one it sells or one supplied by the plumber. The plumber pays the city $18 for the city meter, and $2.50 for the installation. And then, with nothing in the job but some paper-shuffling and a short-term $21 investment, the plumber is then free to charge what he can get—sometimes as high as $40 to $45. The home-owner may save water—but he pays.

D (FOR DRIVER) DAY: JUNE 18—The teamsters union figures that what was good for business in 1949 will be just as good this year. That's why its agents will be stopping your truck drivers June 18 in a new membership drive. Such tactics brought the union 30,000 new members last year, and 1950's goal is 30,000 more (which would give the union over 1,000,000 members). Delegates to a recent conference in Chicago were told: Treat the drivers courteously, but make them join—or get the money if they're members but delinquent in dues.

WALLACE & TIERNAN CHLORINATORS *are*

Standouts in any Plan



AN OIL REFINERY IN TEXAS needs cooling water chlorination.

A PAPER MILL IN WISCONSIN requires white water slime control.

A SWIMMING POOL IN CALIFORNIA wants chlorination to guard against water-borne disease.

A SEWAGE PLANT IN INDIANA needs chlorination for disinfection.

A CAMP IN VERMONT wants to sterilize its well supply.

A POWER STATION IN FLORIDA asks for chlorination to improve heat transfer in condensers.

Whenever and wherever the plans call for chlorination, Wallace & Tiernan Equipment stands out as the first choice of engineers and architects all over the country.

The reasons for this preference aren't hard to find because smart buyers know that with Wallace & Tiernan Equipment they get:

WIDE SELECTION—Wallace & Tiernan Chlorinators and Hypochlorinators come in a variety of models and sizes handling from ounces up to 3 tons of chlorine daily.

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EXPERT DESIGN—All Wallace & Tiernan equipment is the product of expert development by a top notch research group specializing in chlorine and chemical control equipment. This is the same group that has pioneered such famous developments as the Visible Vacuum Principle, Break-Point Chlorination, and Residual Recording during the last 35 years.

SERVICE—Wallace & Tiernan's nationwide service organization is ready to solve bacteria-induced water treatment problems, whatever they may be.

Call your nearest Wallace & Tiernan Representative for your next job involving chlorination. He will be glad to help you.

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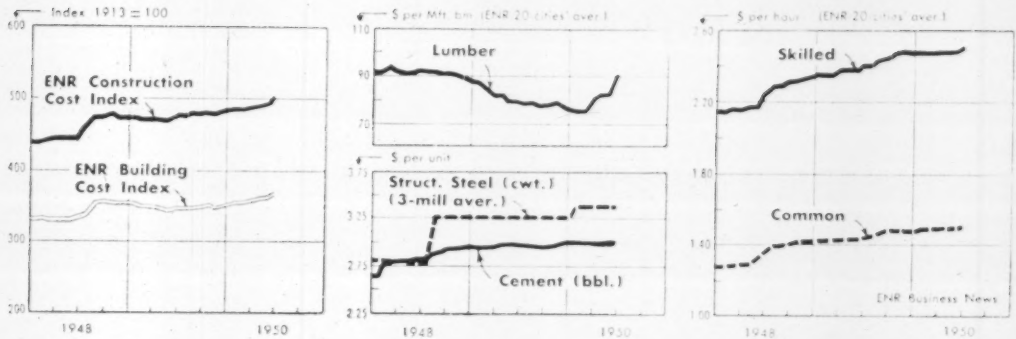
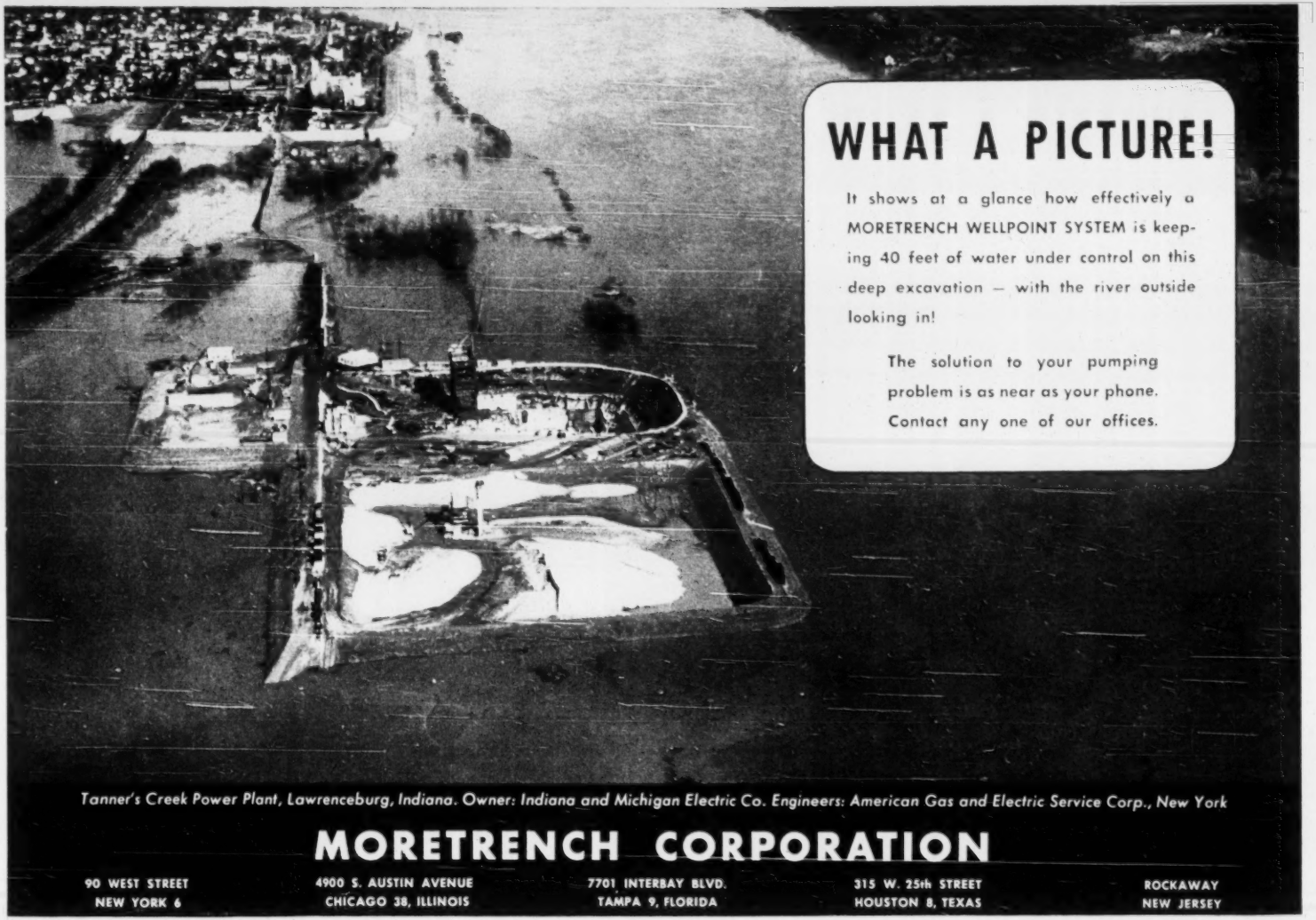
JUNE CONSTRUCTION BUSINESS REPORT



ENR INDEXES (1913 = 100)	June '50	May '50	Change	June '49	Change
Construction Cost	506.45	496.55	+ 1.9	473.78	+ 6.9
Building Cost	372.96	364.27	+ 2.4	349.28	+ 6.8
MATERIAL PRICES (20-cities' average)					
Cement, bulk, per bbl	2.965	2.961	+ 0.1	2.960	+ 0.2
Structural Steel, 3-mill aver., per cwt	3.400	3.400	0.0	3.250	+ 4.6
Sand, per ton	1.968	1.968	0.0	1.978	- 0.5
Lumber, 2x4 Fir, per M ft. bm.	98.971	91.975	+ 7.6	86.382	+ 14.6
Lumber, 2x4 Pine, M ft. bm.	82.433	78.089	+ 5.7	73.803	+ 11.7
Common brick, per M	28.250	28.085	+ 0.6	27.269	+ 3.7
Ready-mixed concrete, per c.y.	10.333	10.318	+ 0.1	10.205	+ 1.2
Structural Clay Tile, 3x12x12 Per M	132.900	132.900	0.0	131.983	+ 0.7
WAGE RATES (20-cities' average)					
Common	1.528	1.511	+ 1.1	1.441	+ 6.0
Skilled (aver. 3 trades)	2.542	2.485	+ 2.3	2.394	+ 6.1
Bricklayers	2.783	2.756	+ 0.9	2.619	+ 6.3
Structural Ironworkers	2.478	2.450	+ 1.1	2.346	+ 5.6
Carpenters	2.289	2.249	+ 1.8	2.209	+ 3.6

	May			Five Months		
CONTRACTS AWARDED (thous.)	1950	1949	Change	1950	1949	Change
Total U. S., ENR reported	$931,153	$581,709	+ 60	$4,411,346	$3,043,841	+ 45
Private	192,953	233,959	- 18	2,506,314	1,455,756	+ 72
Public	738,200	347,750	+ 26	1,905,032	1,588,085	+ 20
Federal	138,972	71,285	+ 95	699,880	333,943	+ 10
ENR Constr. Volume Index, '13 = 100	404	253	+ 47	374	264	+ 40
NEW CONSTRUCTION CAPITAL						
Total	485,825	548,526	- 11	1,892,590	2,202,412	- 14
State & Municipal Bond Sales	329,735	305,216	+ 8	1,141,314	1,119,715	+ 2
Corporate Security Sales	156,090	243,310	- 36	751,276	1,082,697	-31
Federal, non-federal work						
Federal, federal work						

	April vs. March	M	Change	Four Months vs. Three Months		Change
MATERIAL SHIPMENTS & LABOR SUPPLY						
Cement, thous. bbls., Bu. of Mines	14,614 M	14,539 M	+ 1	33,981 3	32,429 3	+ 5
Fabr. Struc. Steel, thous. tons, AISC	155 A	179 A	- 13	577 4	664 4	- 13
Lumber, mil. ft. bm., NLMA	3,341 M	2,526 M	+ 32	8,841 3	6,659 3	+ 33
Lumber Prod., mil. ft. bm., NLMA	3,091 M	2,656 M	+ 16	7,941 3	6,937 3	+ 14
Contract Const. Employ., thous., BLS	2,042 A	2,036 A	+ 0.3	1,950 4	A 1,901 4	2



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Bluestone Bridge Failure

In the unfolding story of engineering progress the most disappointing episodes relate to unsolved failures. Everything is lost, nothing gained.

Such an evaluation must apparently now be placed on the failure in March, 1949 of the Bluestone River bridge in West Virginia. Despite painstaking investigation, to which the contractor and all others involved gave wholehearted support, all findings have proved inconclusive as to the reasons for the failure. Design and erection stresses were found to be correct. Erection procedure was that customarily and successfully followed on similar structures. And the quality of steel met all specified requirements. Yet the fact remains that a collapse occurred when 252 ft of trusses, floor steel and wind bracing had been cantilevered beyond the supporting pier. Eye-witness accounts declared there was little or no wind, nor any unusual extraneous loads on the cantilevered steel.

Most bridge failures of the past, when the causes were determined, have led to improvements in design and construction techniques. That is not to be the case with the Bluestone River bridge failure. It can, however, serve as a warning against any relaxation of the care with which designers handle their calculations, steel manufacturers watch the quality of their product and bridge erectors plan and carry out their operations. Somewhere in this chain something was missed at Bluestone. It might be missed again—or with equal probability this particular cause of failure may never recur. The lesson from Bluestone, therefore, is for heightened respect for the meticulous care and the minute analysis that every engineering job demands. Dedication to this principle is about the only way to increase the odds against mysterious failures.

Civic-Minded Professionals

Are professional men as a group constitutionally lacking in a sense of civic responsibility? That question is raised by two wholly unrelated but curiously similar statements made at professional meetings in recent weeks. Dexter L. Bosch of the firm of Jackson & Moreland, speaking at a meeting of electrical engineers, said: "A count of noses seems to find Mr. Engineer not represented in proportion to his potential strength on neighborhood civic committees nor in the thousand and one other activities of city, state and nation."

At a meeting of the American Medical Association, Louis Bauer, chairman of the association's trustees, characterized as disgraceful the fact that in one Midwest city only 35 percent of the doctors had registered and only 23 percent took the trouble to vote at the fall elections.

It readily could be that the trouble is constitutional, that the type of man who seeks professional training has a mental make-up that gets no satisfaction out of the give and take of working on civic committees. In the case of physicians, their failure to exercise the franchise has a very real danger for that profession. Dr. Bauer told his hearers that if 20 more radical congressmen are elected this fall and a few more radical senators, the socialized medicine fight will be over.

Engineers have no such immediate problem on their hands, yet they could have at almost any time. Anything, therefore, that can be done to stimulate greater civic consciousness on the part of engineers should be a first order of business on the part of state and national engineering groups.

Service Charges For Financing

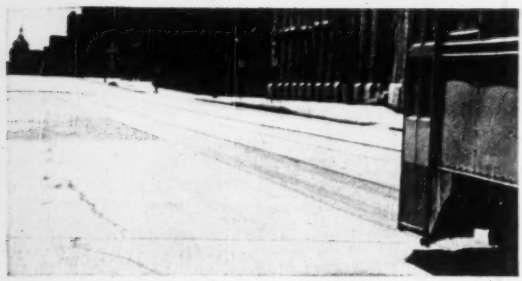
It's no secret: Cities everywhere are pinched between mounting public works needs and severely limited funds for financing them. The public clamors for streets, schools, airports and sewers—often without giving a thought to how they will be paid for. Yet their cost must be met, and it begins to look as if Mr. Citizen is going to have to pay for his projects as he uses them—more and more.

Sewer-service charging (about 450 cities use it) is being given a big boost in New York City. Mayor O'Dwyer has called upon the city council to approve a service charge that will permit the city's vast sewage disposal program to continue without interruption.

The mayor's plea—for acceptance of sewer charges—was made at the cornerstone ceremonies for the new Owl's Head treatment plant in Brooklyn. Without this facility, untreated sewage will continue to be washed on Coney Island's beaches. And without additional funds from some source outside the city's—strained and tax-limited debt structure, similar plants in the program—to cost more than $100 million—will have to be postponed. Such postponement, in addition to the obvious disadvantages, would run afoul of orders of the Interstate Sanitation Commission to clean up New York's surrounding waters.

The cost to avert this situation is small—about 40¢ per residence per month. Collected as a percentage of the water bill, it would be relatively painless to the consumer and inexpensive to administer by the city.

Water service charges have long been accepted as proper and necessary. That sewer charges have not been considered in the same light is one of the paradoxes of municipal management. New York's efforts to institute such charges will, therefore, command more than ordinary interest. They may accelerate a trend toward service charging that will have a marked effect on municipal financing and sanitation progress.



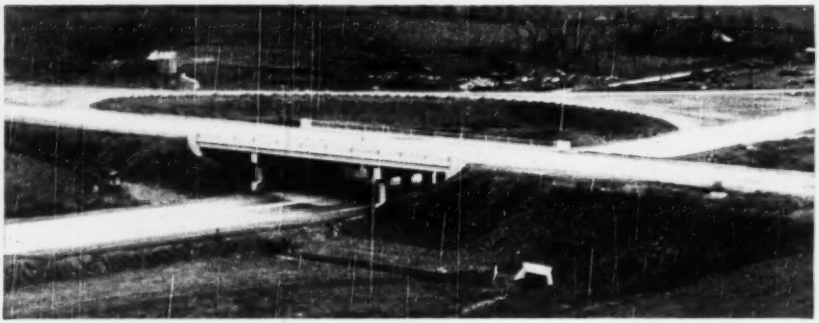
Ten Years Ago...

A Decade of ATLAS DURAPLASTIC AIR-ENTRAINING PORTLAND CEMENT

this test paving was laid in Minneapolis—the first commercial use of Atlas Duraplastic air-entraining cement. Badly scaled background section was made with regular cement. Foreground concrete was laid at the same time with Duraplastic cement. Here are both sections, photographed ten years later, after ten severe winters, heavy applications of de-icing salts and many freezing-thawing cycles—convincing proof of Duraplastic concrete's lasting durability. Longitudinal structural crack shows some raveling. Note perfect transverse joint.

Today...It's "DURAPLASTIC* throughout" on more and more paving jobs

Interchange underpass connecting parkway with Route 30 near Greensburg, Pa. Atlas Duraplastic used throughout. Contractor: W. L. Johnson Construction Company, Rockville, Ohio.



GROWING NUMBERS of engineers and contractors specify Atlas Duraplastic cement for all types of concrete construction in modern highway paving. For straight paving, and for underpasses, overpasses, bridges—more and more—it's "Duraplastic throughout."

That's because experience has proved that Duraplastic air-entraining portland cement makes more durable concrete, that it fortifies concrete against the effects of freezing and thawing—renders it highly resistant to the scaling action of de-icing salts.

And Duraplastic cement requires less mixing water for a given slump, makes concrete more plastic, more cohesive, more workable and more uniform. Bleeding or water-gain and segregation are minimized. The concrete dumps, spreads and screeds easily, permits finishing closer to paver, allows earlier protection for curing. And in structural work, surface appearance is improved.

Duraplastic cement makes better concrete at no extra cost. It provides the precise amount of air-entraining agent interground with the cement for satisfactory field performance. It complies with ASTM and Federal Specifications, sells at the same price as regular cement, calls for no unusual changes in procedure.

Send for free new booklet, *"A Decade of Atlas Duraplastic Air-Entraining Portland Cement." Write to Universal Atlas Cement Company (United States Steel Corporation Subsidiary), Chrysler Building, New York 17, N. Y.*

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Offices: Albany, Birmingham, Boston, Chicago, Dayton, Kansas City, Minneapolis, New York, Philadelphia, Pittsburgh, St. Louis, Waco.

*"Duraplastic" is the registered trade mark of the air-entraining portland cement manufactured by Universal Atlas Cement Company.

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ENGINEERING NEWS-RECORD

JUNE 8, 1950 VOL. 144, NO. 23

Hungry Horse design change helps Northwest power pool

USBR General-Shea-Morrison switch from reinforced concrete to steel for powerhouse—Generating capacity to come in on schedule in 1952 as a result

A design change in the Hungry Horse Dam powerhouse that will at the cost of $155,000 get a substantial new block of power on the line for the Pacific Northwest a year earlier than expected has been approved by the Bureau of Reclamation.

The change involves a very simple matter. It will make the powerhouse a steel-frame structure with a metal roof, rather than the previously planned reinforced concrete structure.

But it will permit work through the coming winter, so that two power house cranes will be ready for operation by July 1, 1951, and operation of power-producing units a little more than a year later, by October, 1952. Although that's about what has been scheduled all along, it will be actually a lot sooner than power supplies, parts and the contractor believed would be possible.

Importance of the move is great for the power-short Northwest, where reserve capacity has been skimpy or non-existent for several years. Until now, power supply people had expected the next major additions to power supply in the area, after the final units in Grand Coulee's second powerhouse next year, would be two 70,000 kw units at Mc Nary Dam in 1953.

• **Badly needed**. How seriously the Northwest needs the earlier delivery of new capacity is documented in the most recent power supply forecast of the National Security Resources Board.

That report shows that, under median water conditions, the region will have a deficit of 194,000 kw or 3.2% of anticipated peak load in 1952. A bad water year would cause a 14.2% deficit. There are a number of qualifications, of course. Such a forecast, even though done by the nation's foremost experts, is an educated guess, three years in advance, as to what's going to happen. Also NSRB's figures aren't the latest available. Its survey is based largely upon a comparable study conducted twice yearly by the Edison Electric Institute (a trade association). NSRB's current survey is based on EEI's October, 1949, survey and another has been completed since then, showing a 5.9% margin for the region in 1952.

• **How it's done**. With the changeover to a steel-frame structure, contractors will be able to work through cold weather, when concreting operations would normally have to be shut down. Working over the winter, workmen will get the two 200-ton traveling cranes in the powerhouse ready for operation by July 1, 1950, so that work can start on erecting the first two turbines. By spring of 1952, the powerhouse should be ready for installation of generators, first of which should be operating by October, 1952, and the second by December.

At the moment, Hungry Horse is no more than a series of huge concrete blocks on the floor of a canyon on the south fork of Montana's Flathead River, 15 mi. from Kalispell. When it's done, it will be the world's fourth largest and highest concrete dam, 520 ft. high, with 3,000,000 cu. yd. of material.

The Hungry Horse construction contract (at $43,451,000 the second largest in USBR history) calls for water storage to start in 1951. There are to be 1,000,000 acre-ft. available by the end of 1952, ultimate capacity 3,500,000 acre-ft. That would let two 71,250 kw units develop about 125,000 kw.

• **It's a money saver**. To all its impressive physical statistics, Hungry Horse will add a new one. It'll be the Bureau's first major use of pozzolan. (ENR Mar. 12, 1949, p. 55) and it figures to save $4,750,000 by displacing costlier cement. Pozzolan is a soot like fly ash. Decision to use it so extensively came after years of research. It may be that Bureau engineers will OK the use of as little as half a barrel of cement per cu. yd. of mass concrete. The Bureau's existing record for a mass concrete dam is one barrel per cu. yd. at Grand Coulee and Chief Engineer J. L. N. McClellan says you can look for a better concrete and a better dam as a result. Delivered at the project, pozzolan will cost $10 per ton less than the cement it displaces.

• **Inland empire heads east**. For reclamation, and more particularly for the Interior Department's power investments, Hungry Horse represents

OLD DAM, NEW TOP—Wilbur Dam—on the Watauga River, in northeast Tenn.—has been given a new top by the Tennessee Valley Authority. The old dam, formerly privately owned, had its crest cut down and four 15x40-ft radial gates installed below a new operating bridge. A 7,000 kw unit is going into an extension of the old powerhouse. Watauga Dam has been finished by TVA upstream. (ENR staff photo)

a new thrill from an old dream. The dream: Full development of the 25,000,000 kilowatts of power which such people as Paul Raver insist can be developed economically from the main river and its tributaries. Raver, once an Illinois economist, utility regulator and university professor, has become a St. John who does more than just preach in the Pacific Northwest's wilderness. As head of the Bonneville Power Administration, Raver long has been plugging for the full Columbia development. As a consequence, you can find old-line Reclamationists, as well as private power people who also fear him.

For an example of what he means, Raver need point no further than Hungry Horse. Its capacity will be limited to 285,000 kw. by no means all of it firm. But just look at what this dam can do for the Columbia's energy potential. When completed it can add 554,000 kw. to the firm power capacity of downstream plants—Grand Coulee, USBR; Rock Island, Puget Sound Power & Light; Bonneville, Corps of Engineers; and others. If full development of the Columbia is ever achieved, Hungry Horse will be responsible for 511,000 kw. of downstream firm capacity, merely by storing each season's high water flow and sending it off downstream in winter, when the main stream's flow is at its lowest and its power demand highest.

• **CVA here's a key**—Hungry Horse is the first realization of this fabulous dream which has entranced the Interior Department for a decade or more. In existence today, Bonneville Power Administration has Grand Coulee and Bonneville Dams on the main stream, with McNary building and Chief Joseph on deck. But Hungry Horse is the first venture back into the hills, the headwaters whence will have to come much of the kilowatts and even more of the regulative stream flow which will make a fully developed Columbia a possibility.

Perhaps even more disturbing, the very existence of Hungry Horse means that some day it will be another trump in the hand of those who clamor for a Columbia Valley Authority.

Painting Research Council

John E. Jackson, treasurer of the American Institute of Steel Construction, announced on May 11 the formation of the Steel Structures Painting Council, consisting of representatives of the associations and organizations concerned with the manufacture of, specifications for, and use of paints and other coatings for the protection of steel surfaces.

INTERNATIONAL STANDARDIZATION—Albert Caquot, new president of the International Organization for Standardization, took office recently for a term of three years, it is announced by the American Standards Association, 70 E. 45th St., New York. ASA, a member of ISO, represents the United States, one of 29 cooperating countries. Mr. Caquot is a pioneer in standardization work in France and has been associated with the Association Francaise de Normalisation (AFNOR), the French national standards body, since its formation in 1926. He has been president of AFNOR since 1943 and was vice-president for the 10 preceding years. Professionally, Caquot is a civil engineer and has done distinguished work in the field of construction.

Homebuilding sparks new construction mark

Federal agencies' "put-in-place" figures reached $1.9-billion last month—exceed '48, '49

Construction activity set a new record in May, exceeding even the seasonal peaks recorded in the fall of 1948 and 1949. That was the finding, last week, of the U.S. Commerce Department and Bureau of Labor Statistics. (See p. 30)

New construction valued at more than $1.9 billion was put in place in May. That total was 14% above April, 1950, and 25% over May, 1949.

• **Private homebuilding leads**—Almost half the advance over April came from private homebuilding. It represented more than three-fourths of the increase over May, 1949. Volume was estimated at $825 million, 15% above the April volume and 50% ahead of the comparable month last year.

Highway construction also rose substantially, and nearly all types of construction expanded seasonally. Factory building reversed its three-year downward trend. Store and other commercial construction also showed larger than seasonal gains.

Private construction accounted for $1.4 billion of the May volume, up 12% over its April figure, 27% over May, 1949. Public construction hit an estimated $551 million, which is 19% ahead of April, 13% above May, 1949. Highway construction boomed, achieving a 52% increase over April, and a 9% jump over the comparable month last year. A substantial increase was registered also in reclamation and flood control work.

• **Ahead for the year**—The first five months of 1950 saw all construction move 21% ahead of the volume for the comparable period in 1949. It reached a total of almost $8.1 billion in May, of which $6 billion was private building. That's a gain of 22% on the comparable 1949 figure. It results largely from the 31% increase in private homebuilding.

Contributing most to the 1950 advance achieved by public construction during the first five months of the year were highways, schools, hospitals and public housing.

A 10-year-old water dispute settled in California

Five damage suits against the Southern California Metropolitan Water District filed by landowners in the Hemet, San Jacinto and Perris areas of Riverside County will be withdrawn following an agreement with the Metropolitan district ending a 10-year-old dispute.

Landowners in the area had charged water from their San Jacinto watershed drained into the 13-mi. San Jacinto tunnel of the Colorado River aqueduct through uncontrolled underground seepage.

Metropolitan agreed to pay $250,000 to be used for the construction of a San Jacinto distribution system, while residents in the area agreed to hold an election to form their own water district. The district will then be annexed to the Metropolitan district. Metropolitan directors have already approved annexation after the local district is formed.

The new district will be permitted to connect with the Colorado aqueduct at three points, with the Metropolitan district paying the cost of one connection. An amount of Colorado River water equivalent to all future seepage into the tunnel will be delivered free to the new district. Additional water will be purchased at $30 an acre foot. Engineering surveys fixing the boundaries of the district have been completed.

LIGHT SHELTER—This aluminum dome has been erected at the Canadian International Trade Fair, Toronto, by Aluminum Construction, Ltd., of England. It's 82½ ft in dia, cost $11,000, and can be erected by six men in three weeks. It's built of hollow square aluminum ribs in compression carried on a thrust ring. Sheeting is attached with self-tapping screws, with 1-in. wide plastic strips for waterproofing joints. Columns are set in concrete and the two-ton dome bolted to them through the thrust ring. Domes of 600-ft dia can be erected. This one covers 5,340 sq ft. C. Howard Crane, Detroit and London, was architect.

USPHS will issue first basin reports this summer in anti-pollution drive

Program calls for 350 reports of two kinds, covering all of the United States — Interpretive series designed for thought-leaders

Swinging into the main phase of the national pollution control campaign, the U. S. Public Health Service this summer will issue the first river-basin reports of an extensive series that will cover the entire country in the next two years. In all, PHS plans some 350 reports, in two different kinds—one addressed to professional people, the other to laymen.

Careful planning is back of the decision to produce two types of reports. For engineers and technicians who will carry out pollution abatement programs in the states and localities, the health service will issue comprehensive technical reports on 260 separate river basins. These documents will collate all available data on existing conditions and will propose basin plans and standards agreed upon jointly in consultation with the states and localities to attain desired improvement of the streams.

• **Opinion leaders sought**—Along with these reports will be issued a parallel set of publications prepared by skilled writers for an entirely different group of readers—the opinion-forming laymen. Documents of the latter type, known as interpretive reports, will be

• **Data assembled this year**—By Dec. 31, these data will be assembled in 15 or 16 reports for as many segments of the country, blanketing the entire nation. The comprehensive summaries may include some recommendations for corrective measures.

These technical reports map out the river basin programs in detail. They consist of four parts. First, the report on each river basin gives a complete inventory of existing pollution and of corrective measures already in operation. Second, it develops a plan—or a set of guide lines—on the water uses desired for the stream at some reasonable time in the future.

• **States consulted**—This second determination is a critical one. Like all other stages of the program, it is worked out by PHS in close consultation with the states and localities. At every step of its pollution control operations, the PHS staff acts on the basic philosophy that the function of the federal agency is to support and supplement the efforts of the states and localities. That was the intention of the Water Pollution Control Act, as viewed by Congress in 1948.

Alternative sets of guide lines for future water use will be offered in some of the technical reports. It then will be up to the states, with their communities and industries, to decide which plan to adopt.

Following the guide lines on wateruses, the report will go into the matter of water quality standards to achieve the desired results. This question, too, could be controversial, were it not for the close collaboration in advance between the states and the Pollution Control Division of PHS. Standards in the report will offer broad guide lines for setting up local criteria.

Finally, the technical report will indicate for a river basin the corrective measures that have to be taken to meet the water quality standard recommended. A rough estimate may be included on cost of these measures.

Engineering reports on the river basins will be reproduced in limited number for distribution to professional people, organizations, libraries and public officers who have a direct interest in the technical phases of the basin program. The interpretive booklets, however, will be printed in larger quantities for wider distribution.

Preparation of the river basin reports by PHS is mainly under the direction of Carl E. Schaub, chief of the Pollution Control Division, and Louis L. Wainer, head of the Technical Services Branch in that division. Dr. Ernest in coordinating the work, Percy Talbot has been put in charge of reports analysis. The pollution control program is under the jurisdiction of Mark D. Hollis, asst. surgeon general.

COMPLETE AT LAST—Bluestone River Bridge has been completed after a delay of six months caused by an erection failure. Truss wreckage may still be seen in the river.

Railroad construction booms in Washington

Hanford atomic plant, McNary Dam job spur new construction, extensive relocation in southeast part of state

Proposed and nearly completed rail line construction is the center of construction interest in southeast Washington.

Scheduled for completion early this month is nearly 27 mi of rail line costing $2,000,000. It will give Richland and the Atomic Energy Commission's Hanford Works a southern freight connection to the Union Pacific and Northern Pacific lines. The new line includes three bridges: a 700-ft multiple steel girder bridge over the Yakima River, a 64-ft single steel girder span over Highway 410 and a 57-ft single steel girder bridge over an irrigation canal. Four piers of the Yakima River bridge are supported on steel H piling, driven as deep as 40 ft into the river bed.

The new line, as well as three miles of yard tracks, is being built by J. A. Terteling & Sons, Inc., of Boise, Ida.

The proposed construction involves relocating the Union Pacific and Northern Pacific railroad lines between the Snake and Walla Walla rivers. It's necessitated by construction of McNary Dam on the Columbia River downstream from the entrance with the two tributaries. The Union Pacific has branch lines along each tributary. The Northern Pacific lines are somewhat inland.

Railroad officials and the Walla Walla District office of the Corps of Engineers have reached tentative agreement on relocation plans which avoid some 30 mi of duplication.

Road officials retire in Calif. department

F. G. Grumm, deputy highway engineer, F. W. Haselwood and E. Q. Sullivan, division engineers to leave

Fred G. Grumm, deputy California highway engineer, will retire July 1 after 27 years' service. During that period, he has been active in the American Association of State Highway Officials.

Fred W. Haselwood, district engineer at Redding, retired June 1, and E. Q. Sullivan, district engineer at San Bernardino, will retire Aug. 3.

Grumm became assistant highway engineer in 1922, holding that position and that of assistant division engineer at Fresno until 1928, when he became engineer of surveys and plans. In 1945, he became assistant state highway engineer, assuming his present post four years later. After schooling in Wisconsin and Michigan, he began his engineering career with the San Diego Cuyamaca and Eastern Railway. He worked thereafter for the San Diego and Arizona Railway and the first San Diego County Highway Commission.

Haselwood's state career began in 1911, investigating water rights. He joined the Highway Division in 1917, transferred to its bridge department in 1923 and became a division engineer in 1924. Sullivan joined the division in 1914 and has been in charge of the San Bernardino district since it was organized in 1923.

Haselwood served the Western Pacific and Santa Fe Railroads and practiced privately before joining the state. Sullivan was construction engineer for Paramount Pictures before joining the division.

Bluestone Bridge rebuilt but failure is unsolved

What caused the failure last year of the Bluestone River Bridge, near Hinton, W. Va., will go down in the annals of bridge construction as an unsolved mystery. An investigation of the accident, just completed by the Virginia Bridge Co., the contractor, and the American Bridge Co., a sister subsidiary of the U. S. Steel Corp., reveals no known cause of failure. The tragedy occurred on March 31, 1949, when 10 panels (252 ft) of cantilevered trusses in Span 3 collapsed without warning, killing 5 workmen. (ENR April 21, p 12 and May 19, 1949, p 24. (See also p 21, this issue.)

Thorough tests proved that the steel used was in accordance with the chemical and physical requirements of the West Virginia state highway department specifications. Stress computations also were found to be correct, and the erection scheme was the same as that used successfully on a number of similar structures.

Opening of the bridge, scheduled for next week (June 15) was delayed 6 months by the accident. Erection procedures for Spans 1, 2 and 3 were revised, due to the delay in fabricating new steel for Span 3. Steel for Spans 1 and 2 arrived on the job before Abutment 1 was completed. Consequently, an erection bent was placed 40 ft from Pier 1, in Span 2, permitting "balanced cantilever" erection over Pier 1 and the bent, extending back to Abutment 1 and forward to Pier 2. Three panels of trusses then were cantilevered past Pier 3 toward Pier 2, stopping at the end of the cantilever arm in Span 3. (Spans 4 and 5 had been erected before the accident.) Final closure then was made at this point with the remaining 9 panels in Span 3 being cantilevered past Pier 2. No changes in design were made except those necessitated by the changes in erection procedure.

School bond issue OK'd

Voters in Fairfax County, Virginia, a growing Washington suburb, have approved a $10,500,000 bond issue for school construction. It will build at least 11 new schools and allow additions to 40 more. The program included another $950,000 issue for an addition to the courthouse and jail. The area is regarded as one of the nation's most critical, from the viewpoint of school facilities, because of the rapid expansion of residential areas that has taken place within it since the war. Bonds will be issued periodically as plans are readied.

Bowles urges program on material prices

Tells Connecticut homebuilders that prices must be held, supplies upped to prevent harm to building boom

Increasing materials shortages and rising materials prices have brought the first proposal from a public official that something be done soon to prevent these trends from constricting the construction boom (ENR June 1, p 23).

Connecticut's Governor Bowles has called for a national conference of building materials supply leaders. It's assignment: To set up an allocation system and to boost materials production so as to obviate price increases. His recommendation came at a meeting of about twenty Connecticut home builders called by the state Housing Authority to discuss building homes in the price range of from $7,500 to $10,000.

"Nobody wants the government to step in to control prices," the former OPA boss told the builders. "It is up to the builders, through their associations, to work with the building materials supply industry to keep prices down."

Bowles' statement came from a figure deeply involved in one of the strategic 1950 election campaigns. However, his point regarding materials prices and shortages was easy to verify. In Toledo, for instance, builders were far from happy over the second $10 MLBM price boost in May. They wondered what effect it might have upon Toledo and Lucas County's greatest home building boom. At the least, the possibility existed that it might lengthen the time necessary to complete homes. Lumber cards were becoming extremely cautious about deliveries, accepting them on an "immediate delivery" basis only. That kind of buying could slow any boom.

• **Prices up everywhere**—Although lumber is the principal item in short supply right now, other tight spots can be found. Structural steel fabricators, for instance, booked 52% more orders in April than in the comparable month last year. Last month, mid-western steel warehouses raised steel shape prices $4 per ton. The move spread to 12 of 20 mill cities by the end of May.

St. Louis reported price increases more general than those of other cities, and it faced a threat of a skilled labor shortage just as numerous large projects were about to reach the construction stage.

Baltimore builders were having out-of-town cement, brick and blocks. Cement is coming in from the Lehigh Valley, with a price increase to cover the extra freight. Local brick makers are about three months behind on deliveries and offer no quotes on new business. Concrete and cinder blocks aren't to be had there either, despite price raises.

Lumber wholesalers, at the end of May, were quoting prices higher than those at the start of the month. Pine prices were rising as fast as those of Douglas fir, too. The latter has reached $100 per M in numerous centers. Distributors expect further increases in the mill price of Southern pine. And Quebec lumber costs face a 5% increase as a result of the forest fires last month at Rimouski and Cabano, which cost about 40 million feet.

Delivered pricing bill sent to White House

Cement and steel supplies in local markets would get a shot in the arm from a bill that went to the White House at the end of last week. The measure aims to clear up confusion and difficulties resulting from decisions made by the Supreme Court on delivered pricing.

Under the proposed law, a manufacturer would be allowed to absorb freight charges on his product in order to compete on a price basis in a local market with another producer whose mill was more favorably situated for delivering to the same market. The bill would require independent action by the manufacturer, without collusion or restraint of trade.

It is a toss-up whether President Truman will sign it. In debate, Sen. Joseph M. O'Mahoney contended that it would not permit return of the basing point system of pricing. Sen. Paul Douglas and others took the opposite view.

Supporters explain that its purpose is clarification, not modification, of existing laws. Since the Supreme Court handed down its famous decision in the Portland Cement case, manufacturers of basic materials have been careful to sell in local markets only on a basis of mill price plus freight. This interpretation has closed local markets to competition from more distant producers.

If the new bill becomes law, it will widen local competition. One result that could be expected would be a flow of cement and steel products from mills to areas that have experienced shortages. The distant mills, of course, would have to absorb freight cost in order to compete in price with local producers. Mill prices accordingly would have to be adjusted to allow for such freight costs as a producer might elect to absorb.

Supreme Court bans price-fixing licenses

U. S. Gypsum, six other wallboard manufacturers enjoined from any "concerted action" in restraint of trade

In a little-noticed order handed down May 29, the Supreme Court took another stand on the long fought antitrust case against U. S. Gypsum, and six other producers, on charges of using patents to fix prices.

The other companies: National Gypsum Co., Certain-Teed Products Corp., Celotex Corp., Ebsary Gypsum Co., Newark Plaster Co., and Texas Cement Plaster Co.

Its immediate effect:

1. To enjoin U. S. Gypsum from enforcing "in any manner whatsoever" the provisions of its patent licensing agreements with the other wallboard producers that have to do with the fixing of prices or terms and conditions of sale; and

2. To enjoin all defendants from any "agreement or understanding" in restraint of trade in gypsum board by license agreements "or other concerted action."

While such an order might ordinarily be expected to cause a price flurry, both among manufacturers and their customers, the probability is against such a result in this case, Washington observers said. Price fixing provisions of the gypsum licensing agreements have not been in effect for some time. Thus, manufacturers have been free to establish prices without this restraint. Such prices should remain stable, Washington felt.

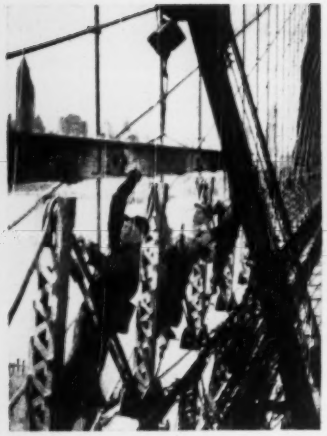
• **Litigation not ended**—The Supreme Court's action was unusual in that it was not specifically requested to hand down such an order.

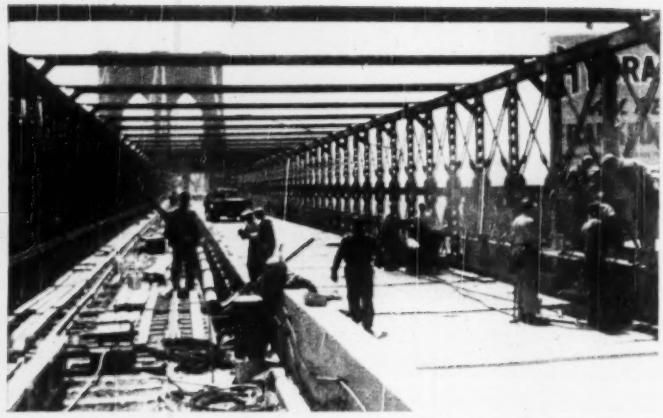
Both sides had appealed from a lower court ruling. The companies wanted the high court to overrule the lower court's "summary judgment" on the basis that they hadn't had their "day in court." Government attorneys wanted the Supreme Court to go even further than the lower court did in its decree against the wallboard producers.

The Supreme Court denied the companies' appeal. But it agreed to hear arguments and decide next fall whether to hand down a tougher ruling against the companies.

But in connection with these two "both" procedural actions, the court went out of its way to uphold that part of the lower court decision that banned price fixing specifically, and use in trust of trade generally.

Government lawyers planned to detect in the language used by the court an unmistakable hint that the court may be bound to go along with them next fall.





IT'S EASY TO GET TO BROOKLYN—Now that an $80,000,000 tunnel links Manhattan and Brooklyn a short distance downstream, (ENR May 25, p 30) New York City's attention swings to the modernization of the Brooklyn Bridge (ENR Nov. 17, 1949, p 28). It's aimed at boosting to 6,000 cars hourly the present capacity of 20,000 cars daily. Trolleys will go to permit a six-lane roadway. At left, workmen place on the old outer truss, which is being deepened, a new top chord, salvaged from the eliminated intermediate truss which set off the trolley tracks from the auto road. At right, they're removing tracks. (Wide World Photos)

Organize California rainmaking firm

Dr. Irving Krick, industrial meteorologist of Pasadena, Calif., has formed the Water Resources Development Corp. to produce rain by silver iodide cloud seeding from the ground.

Krick, who has been operating a long-range weather forecasting service, has been making cloud seeding studies and graphs of potential yields. Heavy rainstorms, 50 cu m weather charts.

• **Bad weather no problem.** Advantage of the silver iodide generator method, according to Krick, are: Best conditions for seeding are often worst conditions for flying, generators, with an automatic seeding device, can be left unattended for as long as 12 hours; many generators can be placed over an area to take advantage of most favorable topographic conditions, and seeding can be controlled better.

To date, the company has signed survey contracts for areas in northern New Mexico, western Colorado and eastern Washington. It has begun work in Washington on its first rainmaking contract.

Krick distinguishes between survey and delivery.

It can't be made to rain "the service isn't going to run anyway. What can be done is to take full advantage of conditions and produce more rain than would normally fall."

• **Coke is the carrier.** Silver iodide is dispersed by burning in a crucible. Particles of foundry coke soaked in silver iodide solution are fed from a hopper. The crucible is heated with non-treated coke. It takes 2,500 degrees F before the feeder is turned on. The machine consumes about a pound of impregnated coke per hour, which is blown into the air by gas. Cold air crystallizes the silver iodide. It is borne aloft by natural air turbulence, forming nuclei for rain droplets.

Water Resources Development field parties are now surveying a 1,200 by 200 mile stretch of Colorado range land seeking to determine if material increases in runoff there can be produced by cloud seeding. A second survey is being made in the company's Pasadena laboratory, where studies of the area's weather are being made.

Pa. Turnpike extension will open on schedule

Despite delays totaling eight days from excessive rain, wet grade and material delays caused by the collapse of the Penn-Harris-Tremaine Contractors expect to open to traffic the 160-mile section on schedule Oct. 15, the tenth anniversary of the opening of the original road.

Work on the Western Extension, though not nearly so long as that to the east, is moving. After a letting scheduled for June 20, there will remain only 4.5 mi of road still to be put under contract on the 36-mi section. Already under contract are the six crossing bridges over the Youghiogheny and Big Sandy Rivers and three subways.

New York City gets PHA OK for 3,700 more dwellings

New York City has obtained federal approval for a substantial increase—from 20,300 units to 24,000 units—in its federal aid, low-rent housing program under the 1949 National Housing Act.

Public Housing Administration approval of this increase in program reservations will enable the city to add four new projects to the 10 already scheduled for the first two years of the program, the city's housing authority announced.

The city's Board of Estimate, meanwhile, has approved "plans and projects" for the Baruch and Washington Houses in Manhattan, the Van Dyke Houses in Brooklyn and the Hunter's Neck Houses in the Bronx. Regional OK'd condemnation of the site for the Brooklyn Houses in Brooklyn.

Construction of the latter, most advanced of all these projects, is expected to begin this summer. The $29,000,000 project will house 1,505 families. The Baruch Houses, a Lower East Side project, will cost about $31,400,000 and house 1,900 families. The Washington Houses, on the upper East Side, will provide 1,500 apartments at an estimated cost of $20,400,000. The Van Dyke Houses will provide 1,450 units at an estimated cost of $19,400,000. The Hunter's Neck Houses will cost about $14,000,000, house 1,200 families.

LaGuardia Houses, after the late mayor, was chosen as the name for a proposed new 500-home project.

Cleveland hearing set by water policy group

Water Resources Policy Commission is encouraged by progress of investigation —Numerous reports received

Cleveland has been added to the list of cities in which the President's Water Resources Policy Commission will hold eight regional conferences in June and July.

The commission set these dates for July conferences: Cleveland, July 24; Springfield, Mass., July 25; and Atlanta, July 31. Dates already had been announced for the five June meetings in Sioux City, Spokane, San Francisco, Denver and Fayetteville, Ark. (ENR May 11, p. 27).

Commissioners expect the April conferences to produce ideas for the water policy report due Dec. 1. Importance of the regional meetings is attested by plans the commissioners have made to attend the conferences.

• **Will meet at Seattle**—Between the Spokane and San Francisco conferences, the commission will hold a regular meeting in Seattle, June 15-20. Members hope to consult some local groups, but no public session is scheduled there.

Chairman Morris L. Cooke told ENGINEERING NEWS-RECORD that the group is much encouraged by progress of its investigations.

A favorable report on progress of a cooperative study by the Engineers Joint Council gave added encouragement to the commission. The EJC Water Policy Project is far enough along to insure completion of its findings by the scheduled date, July 1. Eight committees are collaborating on separate phases under an EJC group headed by W. W. Horner, with Abel Wolman as chairman of a top coordinating committee.

• **75 replies received**—During the last three weeks replies to the commission's engineering questionnaire have been flowing in steadily. The staff was confident last week that a final count would show comprehensive answers from more than 75 of the groups to which the 15 questions were submitted.

Under the commission staff, federal interdepartmental committees are studying characteristics of eight to ten river basins selected for a variety in size, location and physical conditions. Commission staff members sit with these study committees. By these diverse investigations, the commission obtains data on all types of water basin characteristics.

Studies are being carried upstream to the smallest headwater basins. Fundamentally, the commission feels all water resources as well as all stream

WORKS FOR US, NOW—This 450-ton floating crane was captured from the Germans in the last war. Here, the Navy uses it to pick up a 100-ton mobile traction crane which had to be transferred to a new location at California's Long Beach Navy Yard. The smaller crane couldn't be moved by highway without excessive disruption of traffic, so it went by water.

problems stems from these engineering efforts of land use at the headwaters are included in the investigations. To focus public attention on their importance, the commission may put a chapter on small upland watersheds in its report.

One basic design covers 25 Chicago street bridges

Chicago has begun work on a mass-production bridge project which calls for 25 concrete and steel structures to carry cross streets over the Congress Street Expressway.

First of the structures under construction at Peoria Street on the state's West Side, Kenny Construction Co. was awarded the contract at $520,000. Low bid for the second, at Halsted Street, was $376,412, submitted by Lemanger Construction Co. Design of all the bridges is to be similar.

The three-span, rolled-beam structure at Peoria Street will feature concrete piers supported by wood piling driven to hard clay. Deck slab will be concrete 7 in. thick resting on nine steel beams 21 in. deep. These beams, the deepest rolled shape made, will be made of three spliced sections.

The expressway will extend eight miles from the Loop to the southwest suburbs at an estimated cost of $80 million. Extension beyond the city to the Cook County line will cost $35 million more.

Airstrips lengthened at 10 major airports

Six plan no change in existing facilities —Many runways to extend 7,000 ft or longer—Jet plane needs anticipated

Airstrips are being lengthened at 10 major airports in the country, according to a survey by the St. Louis STAR-TIMES. At six other major fields, including three of four in Metropolitan New York, there are no extension plans.

Five of the six airports which plan no extension of existing strips are sea-level airports. Greater air density at these points makes shorter strips feasible. But one sea-level airport, Miami International, is lengthening its three 7,000-ft strips to 9,400 ft each, anticipating greater use of jet and turbo-jet propelled equipment.

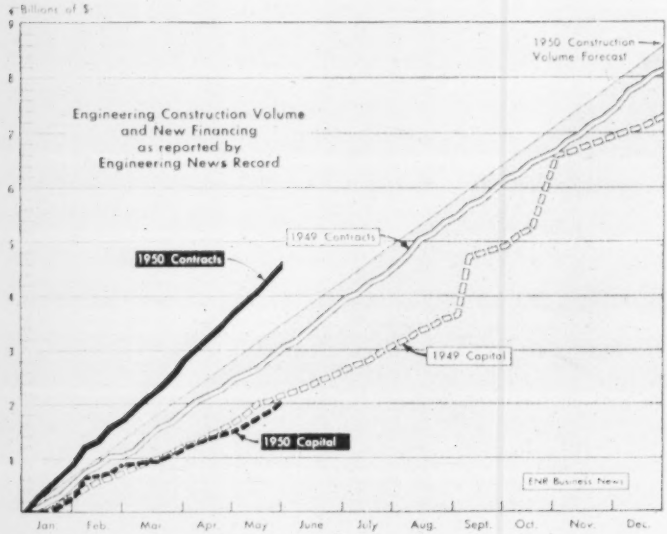
• **10,000-ft strip at Boston**—At Boston's Logan International Airport, a 7,000-ft strip is being extended to 8,000 ft and a 7,300-ft strip to 10,000 ft. At Cleveland Airport, four of eight runways are being lengthened to 7,000 ft. At Denver, Colo., an 8,500-ft strip is to be lengthened to 10,000 ft next year, and Indianapolis' Weir Cook Airport has a 10-year program to extend all four runways to 7,200 ft and to build two new 7,200-ft parallel strips.

Kansas City (Mo.) Municipal Airport won't lengthen existing strips but plans a new one 7,000 ft long, to be completed next year. Los Angeles Municipal Airport plans to extend its two longest strips to 7,500 and 8,500 ft, to be completed in 1952. The four Miami International Airport extensions, 2,400 ft each, are to go under construction shortly and be ready for use in 1952.

Port of New York Authority, which operates LaGuardia International, Newark and Teterboro (N. J.) airports, has a four-runway master plan for Newark. It calls for strips of 7,000 ft and 6,250 ft to be complete in two or three years, others to follow as traffic warrants. There are three strips in operation there now, two of them over 6,000 ft long. At Philadelphia Airport, plans call for the extension of a 5,400-ft instrument runway to 7,400 ft this year. At Lambert-St. Louis Municipal Airport, plans call for the lengthening of a 7,000-ft strip to 7,200 ft next year and the construction of a 6,500-ft runway which will replace an existing 4,750-ft strip. Ultimately, the 7,200-ft runway may be extended to 9,000 ft, but these plans are not firm.

Airports at which no extensions are being planned include Chicago's Midway, New York's LaGuardia, Idlewild, Teterboro and Washington National.

CONSTRUCTION BUSINESS



Construction business booming in every part of the U.S.

Every month this year has been a construction record breaker, and last month was biggest of all. May contract records hit the new peacetime overall volume of $934,153,000. That is an average of $253 million per week for housing, industrial buildings, highways, and engineering construction.

The record activity holds for every section of the country. Middle West private housing and public building, and May contracts, bringing the year total 30% over last year. In the Middle Atlantic States, industrial building, private and public housing, highways, and bridges contribute most to put the area 24% above last year. In the Far West, federal building, earthworks, and waterways contracts are high, along with private housing, for a 73% gain over last year.

Across the nation, private housing is the biggest force in construction this year. Large-scale housing contracts are 105% above last year. But all other private construction is up sharply, too. And so are public highways, waterworks, and the atomic energy program.

Price of steel shapes up 20 cents a cwt

Warehouses in the Middle West have started a 20-cent per cwt increase in prices of heavy steel items, especially shapes and plates. It isn't general across the country yet, but it has hit most big cities.

Chicago and Detroit warehouses started the increase in early May. It spread to Cincinnati May 15 and to Cleveland 2 days later. Baltimore was among the first eastern cities to get it. Following, a large New York City warehouse put the same 20-cent rise into effect, and others are following. Los Angeles warehouses expect to make the change there soon.

Southern California trades get 8¢ raise

The six basic construction trades unions in Southern California will get an 8-cent hourly wage increase effective July 10, if the unions ratify.

But the carpenters say they won't ratify the tentative agreement. They ask a 15-cent raise to $2.25, 5 cents ahead of the operating engineers and 5 cents under cement finishers.

ENGINEERING CONSTRUCTION CONTRACTS REPORTED TO ENGINEERING NEWS-RECORD—MAY, 1950

	May, 1950						U. S. Cumulative Five Months		Change	Canada May,
	New England	Middle Atlantic	South	Mid West	West of Mississippi	Far West	Total U. S.	1950	1949	'49-'50	1950
Public Works											
Waterworks							12,115	95,230	80,319	+ 17	360
Sewerage							20,724	95,243	92,871	+ 3	1,173
Bridges, viaducts, grade separations							33,547	136,892	125,941	+ 11	597
Earthwork and drainage							16,639	175,339	184,435	- 5	1,852
Streets and roads							127,042	484,435	291,101	+ 66	4,852
Subways							27,900	95,688	155,344	- 38	2,612
Other public works							134,207	685,411	480,852	+ 43	20,518
Federal buildings							36,026	134,614	104,301	+ 29	1,402
Total public	42,774	102,433	4,189	30,433	80,828	96,541	438,200	1,905,032	1,588,885	+ 20	21,433
Industrial buildings							138,952	609,880	443,943	+ 40	31,908
Private											
Bridges							2,483	4,975	5,140	- 3	0
Earthwork and drainage							125,108	139,890	52,870	+ 164	11,417
Streets and roads							253,081	1,442,790	1,299,191	+ 11	11,417
Other private work							49,885	323,431	320,891	+ 1	0
Federal buildings							44,674	207,710	27,521	+ 7	220
Total private	22,102	13,900	36,368	59,880	106,079	44,321	492,953	2,506,314	1,455,756	+ 72	23,054
Total Engineering Construction											
May, 1950—4 weeks	55,176	227,133	130,357	140,313	186,907	140,865	931,153				18,519
May, 1949—4 weeks	45,513	183,144	77,477	107,966	96,000	84,956	595,044				4,247
May, 1948—4 weeks	39,000	96,000	39,000	39,000	39,000	39,000	381,095				14,000
Five Months, 1950	241,185	1,135,931	636,012	591,466	993,104	833,348		4,431,316			233,493
Five Months, 1949	185,000	904,000	384,000	468,000	558,000	485,000			3,080,811	+ 44	55,000
Five Months, 1948	161,000	484,000	194,000	194,000	194,000	194,000			1,421,000	+ 11	57,000

BIDS AND BIDDERS

(Major project news received after Construction Reports, page 77, went to press)

Motor Assembly Plant—Bids were opened June 5, at office of Albert Kahn Associated Architects & Engineers, Detroit, Mich. on general contract for foundry and boiler house for motor assembly plant at Cleveland, O., for Ford Motor Co., Detroit, Mich. Estimated cost of this section is $10,000,000. Substructures for buildings are underway and steel is ordered. Total cost of entire project will be $30,000,000. E. A. Fairbrother & Co. and George Miellis, Detroit, are architects. Results not yet available.

College Buildings—Case Institute of Technology, Cleveland, O. plans constructing gymnasium, swimming pool, laboratory, library, administration and other buildings to cost about $10,000,000. J. Guy Treven, Cleveland, is architect for owner.

Residences—Robin Construction Co., Phila., Pa. will construct residences in Hadding, N. J. for Meadowbrook Homes, Inc., Phila, Pa. at about $12,000,000. Edward A. L. Cox, Camden, N. J. is architect.

Hydroelectric Project—Republic of El Salvador, San Salvador, will open bids June 30 for hydroelectric project on Lempa River to cost about $16,000,000. American contractors are asked to bid on phase 1 bid date may be extended. Hazen Engineering Co., Chicago, Ill. is engineer.

Steel Mill—Republic Steel Corp., Cleveland, O. plans constructing $7,000,000 addition to cold rolled sheet mill in Cleveland.

Schools—Fairfax County, Fairfax, Va. voted $10,500,000 bonds for constructing new schools and altering present structures.

Apartment and Shopping Project—Don M. Casto, Don M. Casto, Jr. and Alberts Sicklen, Columbus, O. will construct apartment and shopping center, in Dayton, O. to cost about $8,000,000. Work will be done by owners' forces.

Underground Parking Garage—Bid opening has been extended to June 29 at the request of prospective bidders for the construction and operation for fifty years of garage under Pershing Square in downtown Los Angeles. Recreation & Parks Commission, Los Angeles called for similar bids January 27 but none were received. Estimated cost of project is about $5,000,000.

Apartment—Ring Construction Co., Washington, D. C. will build apartments in Washington, D. C. for International Brotherhood of Electrical Workers, Washington, D. C. at about $4,500,000. Wallace Dixon, Washington, is architect.

Homes—Commonwealth Homes Corp., Tampa, will construct $4,000,000 homes in Tampa, with own forces. Joseph Veccaro, Tampa, is architect.

Warehouse Addition—Firestone Tire & Rubber Co., Akron, O. plans branch warehouse addition in Des Moines, Ia. Estimated cost is $3,000,000.

Dormitories—Gilbane Building Co., Providence, R. I. was low at $4,097,482, when Brown University, Providence, opened bids May 18 for dormitories. Perry, Shaw, Hepburn, Kehoe & Dean, Boston are architects. Cleverdon, Varney & Pike, Boston, are engineers.

Water Supply—Colorado River Municipal Water Assn., Big Spring, Tex. plans water supply, including dam, for towns of Midland, Big Spring and Odessa, Tex. Estimated cost will be $6,500,000. Freese & Nichols, Fort Worth, are engineers.

Roads—Hanlon-Conley Construction Co., Cleveland, O. was low at $8,050,376 for Section 51B, road in Allegheny County, when the Pennsylvania Turnpike Commission, Harrisburg, took bids May 31. D. W. Winkelman Co., Syracuse, N. Y. was low at $4,083,950 for Section 29B and 29C, Beaver County at same opening.

Hospital—St. John's Hospital, Springfield, Mo. received low bid for constructing nurses' home and boiler house, in Springfield from McGough Brothers Construction Co., St. Paul, Minn. at $4,092,000. Maginnis & Quick, St. Louis, are architects.

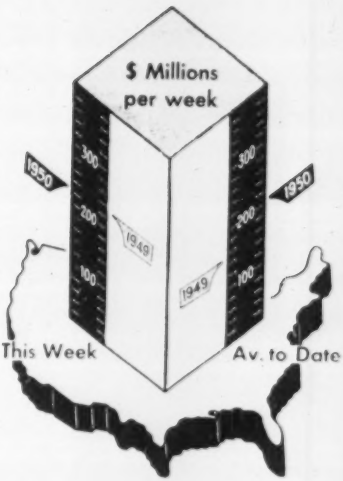
Apartment—McDonald Construction Co., St. Louis, Mo. has been awarded contract for $3,700,000 apartment in St. Louis, by Essex House Warner Kanter Co., Birmingham, Ala. Palmaffone & Mims, Birmingham, Ala. and C. G. Wenzel, St. Louis are architects.

Hotel, Apartment and Shopping Center—H. Leslie Hill, Dallas, Tex. plans constructing hotel, apartment and shopping center in Dallas, to cost $5,500,000. Walter W. Ahlschlager, Dallas, is architect. C. M. Smith and J. H. Morgan are engineers.

COSTS AND VOLUME

ENR INDEX NUMBERS

Index Base = 100		1913	1926
Construction Cost	June 30	206.45	243.43
Building Cost	June 30	222.96	261.61
Volume	May 30	403	206



Activity This Week

As reported to ENR (in millions of dollars)

Amount of contracts let

	Week of June 8 1950	Week of June 8 1949	Cumulative (23 wks.) 1950	Cumulative (23 wks.) 1949	% chge
Public Works	$266.0	$143.4	$3,165.2	$2,787.8	+13.5
Utilities & Misc.	21.8	146.4	1,243.5	1,243.5	+11.1
Total Public	$287.8	$289.8	$4,408.7	$4,031.3	+9.4
Total Private	127.1	242.0	1,863.9	1,863.9	+6.1
U. S. Total	$414.9	$531.8	$6,272.6	$5,895.2	+6.4

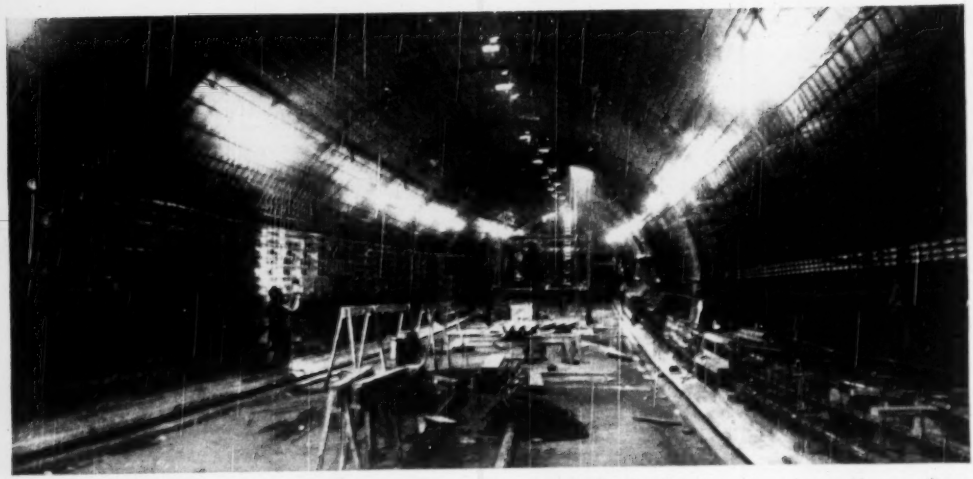
Contracts by type of work

	This Week	Week of June 8 1949	Cumulative (23 wks.) 1950	Cumulative (23 wks.) 1949	% chge
Waterworks	$ 4.0	$ 10.0	$ 53.6	$ 53.6	+0.1
Sewerage	2.4	10.1	55.0	55.0	+1.1
Bridges	10.1	30.4	131.2	131.2	+11.0
Highways	73.1	33.2	1,161.1	1,161.1	+6.4
Earthwork					
Waterways	19.5	20.0	273.1	273.1	+2.6
Dredging					
Public	22.8	43.8	451.4	451.4	+4.2
Industrial	27.1	39.2	439.1	439.1	+4.0
Commercial	19.1	139.2	1,163.6	1,163.6	+4.4
Unclassified	10.4	20.4	245.5	245.5	+4.5

NOTE: Miscellaneous projects included in Waterworks and Waterways (public) exceed $25,000; other public projects, $5,000 to $25,000; industrial buildings, $100,000; other buildings, $200,000.

New capital for construction

	Cumulative (23 wks.) 1950	Cumulative (23 wks.) 1949	% chge
Corporate securities	$ 983.4	$1,171.6	−16
State and Municipal			
Excl. Housing	927.9	833.5	+11
Housing	258.0	142.9	+81
Total Capital	$1,186.0	$1,063.3	+10



CONCRETE AND TILE are the final step in completing this section of the new Washburn Tunnel, near Houston, Texas.

Houston Tunnel Opens for Business

OPENED FOR BUSINESS late in May, the $7,000,000 Washburn Tunnel under the Houston ship channel is ready to channel heavy local and through traffic around the congested center of Houston, Texas.

The last bulkhead in the 2,936-ft tube was removed in the subaqueous section on Feb. 17, and work on access roads and finishing was rushed to meet a May opening date.

The tunnel, originally known as the Pasadena tunnel, is the center of a total of 7.4 miles of access roads now being built at a cost of $2,000,000 both on the north and south sides of the ship channel that connects Houston with the Gulf. Included are three four-lane highways, three bridges, two traffic circles and two railroad underpasses.

The access roads will relieve traffic congestion in the suburbs of Pasadena and Galena Park, and together with the tunnel itself will give Houston its first circumferential highway, eliminating the necessity for South Texas traffic traveling through the congested business center of the city.

Tunnel Details—The tunnel has a total length of 5,791 ft between grade points, made up of 859 ft of open ramps, 1,436 ft concrete pile-built in the dry, an outlet open trench at each end, and 1,500 ft of steel and concrete tube sunk in a trench excavated across the bed of the ship channel.

The tube is circular in shape, with an inside diameter of 32 ft, to accommodate two lanes of traffic, police walkways, air ducts and power and telephone circuits.

Maximum grade on the approaches is 6 percent. The top of the tunnel is 80 ft below mean low water in the ship channel, which has a navigable depth of 45 ft.

Steel for the four sections of the tube under the channel was fabricated in the plant of the Ingalls Shipbuilding Co. at Pascagoula, Miss., and each tube was assembled on the shipways there. After bulkheading and launching the tube sections were ballasted for stability and floated 500 miles through the Gulf of Mexico and the ship channel to the Clinton Dock at Galena, Texas, about 2 miles from the tunnel site. There the main circumferential reinforcing for the 24-in concrete strengthening ring was completed, the steel lining tied to longitudinal loops which had been attached to the inner shell by flash-welded studs. Concrete for the roadway, walks, ducts and conduits also were installed there. As much of the outside concrete as possible without exceeding the draft permitted in towing the sections to the site.

Sections Sunk in Place—Upon arrival at the tunnel site, each section was sunk accurately by adding enough tremie concrete to produce a negative buoyancy of about 20 tons. The sections were controlled and supported during sinking by two floating cranes, and were landed on two steel pile bents previously driven in the bottom of the trench. Eighty tons of concrete were then loaded into the sections and they were aligned and secured to the adjacent tube by positioning pins and steamboat ratchets.

The joints consisted of circular knife edges on one tube, drawn into the gasketed circular groove on the other to form a watertight seal. A heavy blanket of tremie concrete was poured outside these joint sections and sand fill jetted around and under the tube, after which temporary supports were cut. Concreting of the outer shell was completed with tremie-placed concrete.

With the sinking and aligning operations completed, the temporary watertight bulkheads at either end of each section were removed, the joints made permanently watertight by a channel ring welded across the gasketed joint, and the interior filling, paving, lighting and other accessories installed.

Shore Sections—The shore sections, as previously noted, were built in open cut. When the cuts had been graded to the required shape, a 4-in blanket was laid down on the subgrade for the width of the tunnel section, with keys or waves at intervals to resist the tendency of the tunnel arch to slide downhill. Membrane waterproofing, consisting

of fabric and tar 5 plies thick, was installed on this sand bed to act as a base for a segment of arch and invert that was poured and cured.

A traveler for the inner forms then was erected on rails placed on the invert, reinforcing was installed, the outer form traveler was positioned and the main arch was concreted in a single pour. Roadway haunches and slab, curbs, sidewalk and the conduit casings were poured in subsequent pours.

When the arch concrete was properly cured, a further waterproofing membrane was applied over the entire arch, protected with fiberboard insulation. The trench was then backfilled with permeable material used close to the arch and spoil from the excavation for the remainder of the backfill.

Operating Features. Practically automatic in its operation, the tunnel has a ventilation system including three blower fans in a ventilation building to pump fresh air into the air duct under the roadway. Each fan has a top capacity of 342,000 cfm and two of the units can supply air required, the third being used as a standby. There is no upper exhaust duct as in many vehicle tunnels. Exhaust air moves to the entrances in the upper part of the tube.

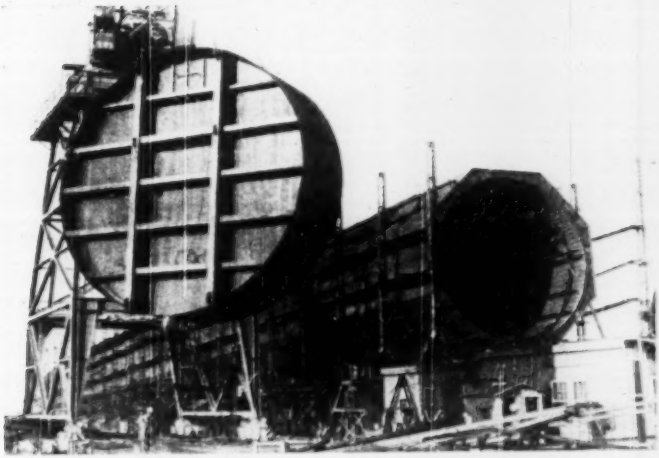
Two devices continuously monitor the air. One maintains a continuous count of the number of vehicles and the other a continual analysis of the air. Activate electronic controls determining the speed of the fans. In this way it is planned to keep the concentration of carbon monoxide below 4 parts per 10,000.

A pumping system is installed to clear the tunnel of any rainfall that comes in from the open ramps, and at mid-tunnel there is a pumping station to handle any accumulation of water from seepage or washing operations.

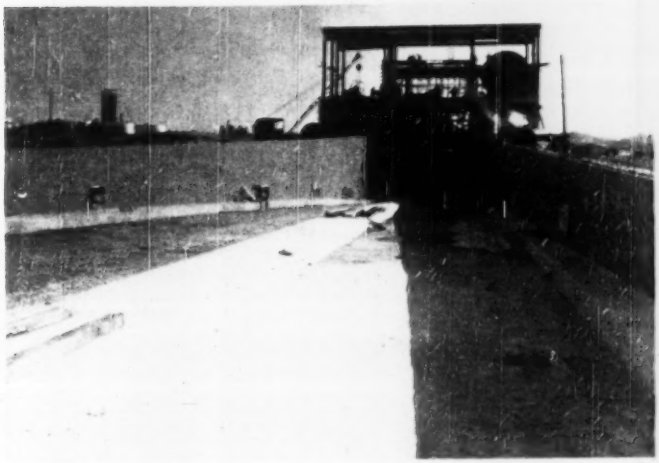
Illumination is provided by a continuous fluorescent lighting fixture at the crown of the arch. This is supplemented by other fixtures providing higher intensity near the portals.

The tunnel and access road system was financed through bond issues approved by the voters of Harris County, of which Houston is the seat. Principal contractor was Merritt Chapman & Scott Corp. of New York for construction of the tunnel and ramps.

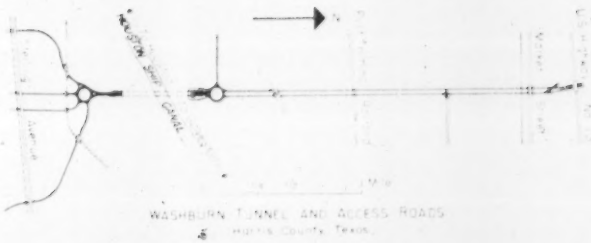
Palmer and Baker, Inc., consulting engineers, of Mobile, Ala., prepared plans and specifications, and acted as administration and supervision of the construction contracts, both on the tunnel and access roads. Robert R. Baker, vice president, was in charge of construction and contract administration, with Rear Admiral William H. Smith (CEC, USN retired) as chief engineer.



BULKHEAD, handled lightly by gantry crane, is ready to go in place to seal section of tube, ready for floating to tunnel site.



ENTRANCE to tunnel (from north side) will be under the ventilation building going up at center of photo.



LOCATION of the new facility is the center of a network of access roads now under construction. Roads will provide by-pass of downtown Houston.

Controlled performance tests provide an engineering basis of comparison for . . .

Conventional and Upflow Settling Basins

H. S. Morgan
Consoer, Townsend & Associates
Consulting Engineers
Chicago, Ill.

D. R. Miller
Sanitary Engineer
Great Lakes Naval Training Center
Great Lakes, Ill.

WILL a sludge-blanket type of upflow coagulation basin function successfully on water of low turbidity? Engineers faced with selection of coagulation equipment for use on large bodies of quiescent water find this question arising most often in developing supplies from the Great Lakes and from some rivers with extremely low turbidities. Typical are power-making districts of the U. S. and Canada.

An installation at the Naval Training Center, Great Lakes, Ill., afforded an excellent opportunity to find a partial answer, albeit using Lake Michigan water. A 2.5-mgd conventional sedimentation (downflow) and a 3-mgd upflow unit (with bowl) made possible the comparison of the two types of coagulation facilities.

• **Findings**—Carefully controlled and evaluated performance tests led to these conclusions:

1. The upflow basin tested will function with use of activated silica on lake water of turbidity of 10 ppm or less, and low alkalinity.

2. Operation of upflow basins is more complex, requiring more control and operator attention than conventional tanks.

3. Combined annual expense of amortizing and operating plants with upflow units is less than that of facilities with conventional downflow tanks having mechanical sludge removal. This holds for waters with low turbidity and prevailing construction costs. It is particularly true when land costs are high or site of adequate size is lacking.

4. Anthracite media with 0.70 to 0.85 mm effective size materially increased filter runs of upflow unit effluent treated with activated silica coagulant aid. But this media also lengthened filter runs with downflow tank effluent dosed only with aluminum sulfate coagulant.

5. Upflow units are sensitive to raw water temperature increases when the rate of change is equal to or greater than 1 deg per hr.

• **Plant characteristics**—Raw water is taken from Lake Michigan at a 42-ft depth through an 8,000-ft intake pipe. Total water delivered was measured by a Venturi meter, inflow to the upflow unit by a propeller-type meter.

Arrangement of the dual-facility plant is given in the flow diagram. The settled-water flume has a gate dividing the east from the west group of filters. This made possible delivery of effluent from the conventional basin to filters 1 and 2 and that from the upflow unit to filters 5 and 6.

Overflow rate from the conventional sedimentation basin was about 0.4 gpm per sq ft. The upflow unit was designed with a nominal capacity of 3 mgd at a rise velocity of 2.25 gpm per sq ft of clear-water area.

Effective size of filter sand when installed was 0.45-0.55 millimeter. From 4-6 in. of sand had been washed off the filters since the plant was built. An analysis indicated average effective size of remaining sand or all filters to be about 0.60 mm.

Pumping economy is effected in winter by passing raw water through power-house steam-turbine condensers enroute to the treatment plant. As power load increases in the morning, condenser-water temperature rises. Temperature of water received at the treatment plant then increases 2-10 deg.

This change, occurring in a short period, causes severe temperature "boils" in the upflow unit. Considerable floc passes over effluent weirs, materially shortening filter runs.

Condensers, on the other hand, can be passed during warm weather so that cold water goes directly to the plant. Water temperature in the summer reaches 70 deg.

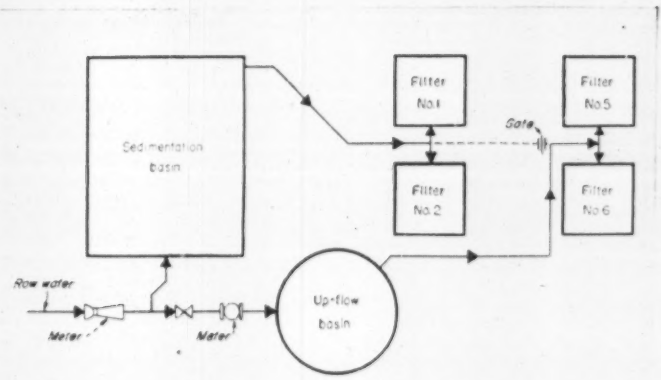
To eliminate the abnormal effect of increasing water temperature, tests of the two settling basins were made in the summer. Pre-test trials on the water showed that no conclusions could be drawn from comparative performance.

• **Pay-off tests**—Before final testing, the upflow unit was revamped to include latest design modifications. A number of settling plates and draft-tube baffles (photo) furnished without charge by the manufacturer were installed. Weirs were re-leveled and points of chemical application were changed at the same time.

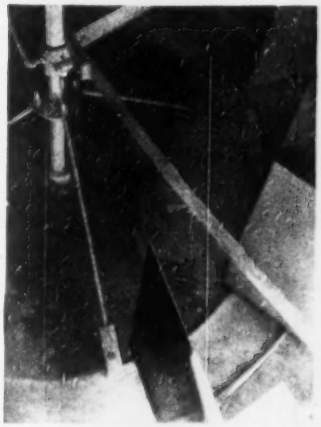
Tests were then continued for about a month, taking water directly from

TABLE I—COMPARISON OF FILTER RUNS WITH EFFLUENT FROM CONVENTIONAL AND FROM UPFLOW SETTLING BASINS

	Raw Water			Up-Flow Basin				Sedimentation Basin			
	Temperature deg F			Aver. Rate	Grains	ppm		Aver. Rate	Grains	
Date	High	Low	Turbidity ppm	Thru Put Mgd	Per Gal Alum	Activated Silica	Effluent Turbidity	Thru-Put Mgd	Per Gal Alum	Effluent Turbidity
Sept. 13	67.5	66.5	8	2.88	1.50	3	2	2.52	1.69	4
Sept. 14	68.5	67.5	7	2.88	1.67	2.5	2	2.64	1.66	5
Sept. 15	68.5	67.5	5	2.88	1.50	2.0	1	2.64	1.72	4
Sept. 16	64.5	64.5	5	2.88	1.58	2.0	2	2.76	1.75	4
Sept. 17	63	62.5	5	2.88	1.58	2.0	1	2.74	1.58	4
Sept. 18	64.5	63.5	5	2.88	1.74	2.0	2	2.47	1.71	4
Sept. 19	66.5	65.5	5	2.88	1.67	2.0	2	2.33	1.66	4
Sept. 20	64.5	63.5	5	2.88	1.75	2.0	2	2.53	1.58	3
Average	66	65	5	2.88	1.62	2.3	2	2.59	1.67	4



COMPARABLE PERFORMANCE TESTS of a conventional sedimentation tank and an upflow-settling basin were made with side-by-side units. A pair of rapid sand filters served each unit.



STEEL PLATE BAFFLES were installed in the inner draft tube of upflow settling tank to reduce cone currents.

Lake Michigan. It took several days at the start to build up a slurry pool in the upflow unit and make adjustments for best operating performance.

Raw water chemical dosage to the upflow unit during testing was: Aluminum sulfate into the influent pipe about 5 sec ahead of activated silica; and activated silica about 1 sec ahead of the draft tube. Alum dosage was about 0.67 grains per gal; activated silica varied from 3.5 ppm. Activated silica was prepared by batching and aging 1 hr before use.

Only alum was added for coagulation to the conventional basin. Dosage was about 0.7 gpg.

Activated carbon was added to both upflow and downflow influent for taste control. Rate was about 45 lb per mg. Raw water was also chlorinated at intake pumps.

• **Test observations.** When controlled runs were started, raw water turbidity averaged 6 ppm. The upflow unit appeared to be working well. Floc was breaking cleanly in sharp patterns. The slurry pool was well defined. Effluent turbidity averaged 2.5 ppm.

Effluent from the upflow unit was crystalline but a small amount of the colloid continually kept the unit filled. Effluent from the conventional basin was slightly cloudy on the filters due to pin point floc.

In spite of better appearance and turbidity, upflow basin influent did not give filter runs as long as that from conventional basins. It is believed that activated silica produced a floc so tough in water at minimum temperatures that although chemical dosages were small, filter runs were materially reduced. The activated silica should be tested, apparently, to determine formation with low raw-water turbidity.

Some floc carryover may have also been caused by agitation of water in the upflow unit that released air to coalesce on floc particles, thus reducing their specific gravity. Determination of dissolved air in raw water indicated supersaturation.

Another factor checked was a lower rate of displacement. When throughput was reduced from 2.25 to 2.0 mgd, there was no apparent effect either on filter-run length or quality of upflow unit effluent.

Algae in raw water materially shortened filter runs with effluent from both settling basins. When wind caused a shift in lake currents, algae were washed away from the intake. Sedimentation basin filter runs increased from 12.5 to 31 hr while those with upflow unit effluent rose from 8.4 to 10.9 hr.

These currents also increased raw water turbidity and temperature. The 1 to 5 deg rise produced some floc upset and "boils" in upflow units.

Total alkalinity of Lake Michigan water is very low, about 115 ppm. So lime was added in an attempt to get a floc. Lime was fed at the rate of 0.62 gpg. Readings of pH were:

	pH readings		
	Raw Water	Basin Effluent	Filtered Water
Without Lime	8.2	7.6	7.6
With Lime	8.3	8.3	8.0

Filter-run results with lime-dosed water were inconclusive.

Activated silica dosage to the upflow unit was reduced gradually. The basin continued to function at a dosage of 2 ppm. However, the slurry pool quickly lost definition and floc began to leave the basin in considerable quantity when activated silica was entirely cut off.

• **Anthracite filtering media.** As a final experiment, anthracite filtering sand about 9 in. deep was placed over filter 6. Its effective size was 0.70 to 0.85 mm.

Tests were then run for 7 days. Data taken during these runs com-

TABLE II—FILTER OPERATING DATA WITH INFLUENT FROM CONVENTIONAL AND UPFLOW SETTLING BASINS

	Sedimentation Basin Supply		Upflow-Basin Supply	
	Filter No. 1	Filter No. 2	Filter No. 5	Filter* No. 6
Average Run (hr)	46.0	33.1	17.8	29.6
Average Total Head Loss (ft)	9.45	8.92	8.56	8.75
Total Water Filtered (mg)	4.55	8.43	6.16	7.19
Total Wash Water (gal)	145,000	235,000	247,000	228,000
Wash Water (%)	3.31	2.80	4.01	3.18

* Anthracite filter sand on the filter.

pure filter runs with effluent from the two types of coagulating units. Both were operating under fairly good conditions (Table I).

Filter 6—with a surface layer of anthracite media—might be taken as an indication of upflow basin efficiency. Then this plant—operating solely from the upflow basin—would be likely to require 25% more wash water per unit of capacity than when operating from conventional sedimentation basins serving silica sand filters.

Subsequent to these tests, upflow basin were placed in series as rapid mix basins ahead of sedimentation units. By continuing operation with the anthracite-surfaced filter, filter runs were increased about 11%. This is about the same increase as when the upflow basin pretreatment was used.

Past operating records of all filters were checked to determine any consistent differences in filter runs that might affect test accuracy. Records inspected indicated no major difference.

Filter-rate controllers and loss of head gages were checked and filter-drop tests made. Data given in tables are modified by all correction factors. The tests were intended to be practical rather than scientific. All factors were not controllable, but tests were run in conjunction with normal plant operation.

• **Cost analysis**—Construction cost of upflow basins is substantially less than that for equal-capacity standard sedimentation basins with mechanical sludge removal. An analysis indicates that for this type of water, upflow basins—requiring more chemicals and using more wash water—will cost substantially less on an annual basis than standard downflow basins of comparable capacity.

Operating data (Table II) shows the performance comparison between the upflow unit serving filters 5 and 6, and the sedimentation basin serving filters 1 and 2.

• **Credits**—During the tests, all operation of the upflow basins was conducted by Infilco, Inc., personnel under the direction of A. A. Kalinski, chief development engineer. The sedimentation basins and filters were operated by the Naval Training Center waterworks personnel under the direction of D. R. Miller, sanitary engineer. Consor, Townsend & Associates, who designed the improvements, were represented by an engineer-observer at intervals during testing.

The upflow units were manufactured by Infilco Inc., Chicago, Ill.

Invert Bridge Spots Concrete Trucks

When Walsh-Perini got to the invert-paving phase of their Downsville Dam diversion tunnel job, they assembled an efficient concreting bridge-traveler out of materials that already had been used on the job.

These materials included structural members and four two-wheel trucks from the huge jumbo that had been used for driving the 40-ft dia tunnel. (Said to be the biggest in the world, the jumbo was described in ENR Jan. 20, 1949, p. 78).

On the rolling bridge the contractors mounted a hoisting engine and truss-platform and guide timbers. They also put simple screw-and-wedge brakes on two of the bridge's trucks (one brake on each side).

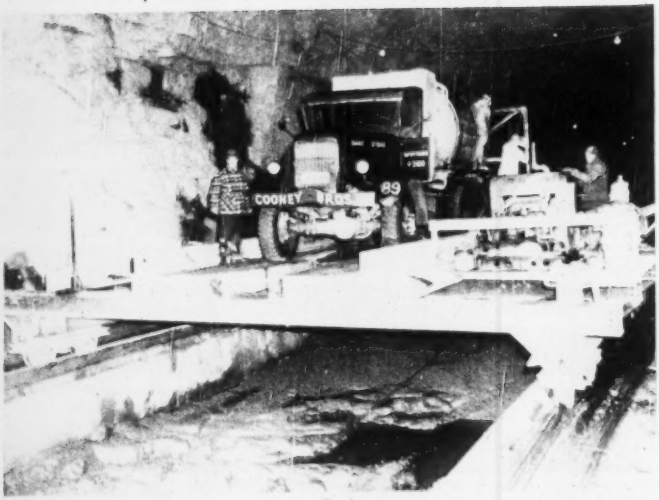
To set the job up, contractors first poured tunnel curb walls, on which they laid rails that would carry the bridge. Then they built a movable timber truck ramp on existing invert-elevation concrete at the tunnel's outlet.

Concreting proceeded in 100-ft sections from the outlet (lowest elevation), the concrete being poured backward within each section, from transverse header to the previously placed section.

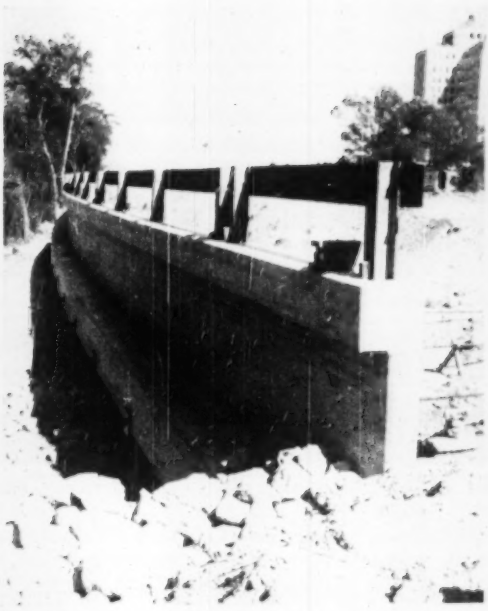
In operation, a loaded 4-yd concrete truck backed up the ramp onto the bridge. The hoist operator put the power on his line—a two-part tackle dead-ended to a snatch block on a tunnel rib up ahead—and hauled bridge and truck upgrade to the point where the truck dumped its load. To return, the operator slacked off his line, allowing the bridge to roll back to the ramp. Brakemen, using hand spikes on the brake screws, checked the rig to a stop.

After three of the five 100-ft sections had been concreted, crews moved the timber ramp forward on the new invert. Invert between portal and ramp was filled temporarily with cinder subgrade to facilitate concrete-truck operation over the invert's crown section.

Walsh Construction Co. (New York) and B. Perini & Sons, Inc. (Framingham, Mass.) built the tunnel for the New York Board of Water Supply, in connection with three contracts for the first stage of Downsville Dam. J. S. Macdonald was for some time project manager and A. J. Adler was project engineer. The contractor's office is in Roscoe, N. Y.



SELF-POWERED RIG for setting concrete trucks over Downsville Dam diversion tunnel invert forms was made from parts of huge jumbo that drove the tunnel. (John Clark photo)



PILE-SUPPORTED WALL retains new highway fill in Houston, Tex. Wall is tied to deadmen under roadway for stability. Beam at bottom caps piles; beam at top carries railing.

TIES TO DEADMEN are 2¼ in. dia and 70 ft long. Stone piles and sticks kept them level while sand backfill was placed. Crib drains on wall face were gravel filled.

Hog-Tying a Retaining Wall

/ Elton Sterrett
Houston, Texas

IN WIDENING right-of-way for the new three-lane highway replacing old Buffalo Drive in Houston, Texs, a concrete retaining wall had to be built on a curve across the bed of a bayou (a bottom of quicksand and long-buried log jams).

The usual wale footing for wall stability could not be supported on this base. So the structure was put on precast concrete piles and "hog-tied" to deadmen under the new roadway.

Piles were driven in pairs along the length of the wall, then capped with a reinforced concrete beam. This beam not only encases the piles but also holds the steel ties that were anchored under the backfill to keep the wall safe from sliding or overturning. Reinforcing rods tie the wall to the beam, and a second, lighter beam, topping the wall, carries the guardrail posts.

At 16-ft intervals through the main beam, 4-in holes were cast, horizontal and radial to the slight curve on which the wall was constructed. In line with the wall and 70 ft back from it, a trench was cut to the depth of the holes, and lateral pits were made from the holes in the wall to the parallel trench.

In the face of the wall, and extending back to the lateral trench, 70-ft long tie rods of 2¼-in dia steel were placed, with a heavy square washer or plate on the outer face of the beam and a nut to allow tension adjustment. Inner ends of the rods were anchored in deadmen in the lateral trench, which was then backfilled and allowed to settle before all fill was placed behind the wall.

The "hog-tie" rods, as they were termed on the job, were doped with hot creosote and then wrapped with a coating of glass fiber cloth to protect the coating against soil stress as the fill settled. The rods were leveled across the open space by wooden cross-braces or heaped stone, so that they would not sag under the fill before it could be compacted. Specifications called for an all-sand fill up to a level higher than the tie rods, to protect them against possible damage by heavier material to be dumped later. Holes through the tie beam were left open; it was felt that the sand would fill the apertures around the rod and still provide what drainage were necessary.

To remove water from behind the wall, small timber cribs were carried up the inside face between each pair of tie rods. These cribs were filled with gravel up to 1-in size. At the base of each crib was a drain through the wall with a check valve on the outside to prevent entry of water in the event the bayou flooded above the height of outlets.

With the light timber cribs to hold the gravel in place until the fill had consolidated, it was felt that ultimate decay of the crib's wooden slats would not disturb the gravel sufficiently to affect the drainage channels thus provided.

Work on the enlarged Buffalo Drive is under direction of J. M. Nigle, director of public works for the city of Houston. J. G. McKenzie, bridge engineer in the department of Public Works was responsible for design of the wall. Contractor on the job was Bishop Construction Co. of Houston.

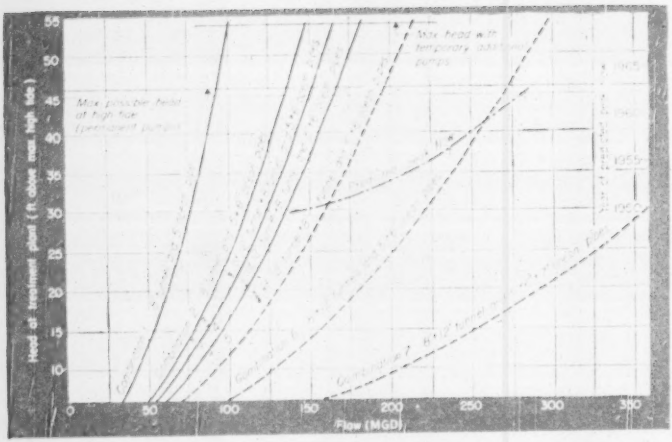


FIG. 1. HYDRAULIC CAPACITY of the outfall system was kept even with load by step-by-step development. Combination 4 will be finished this year. Additional construction will be necessary if predicted flow increases materialize.

Step-by-Step Tunnel Construction Keeps Sewer Capacity Ahead of Flow

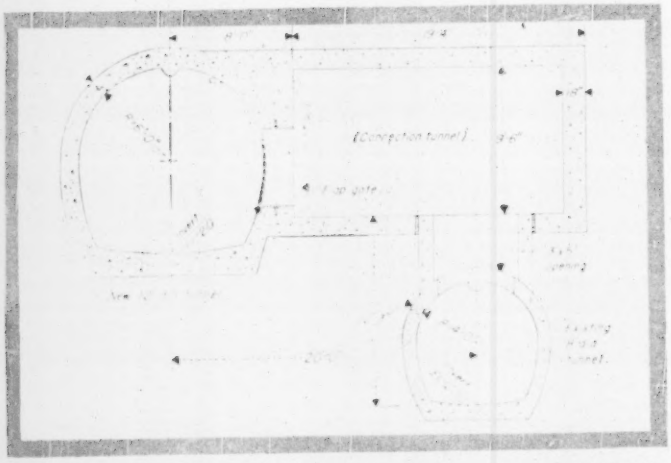


FIG. 3. BY CONNECTING the first section of 12-ft dia tunnel into the old 8-ft dia tunnel hydraulic capacity of the outfall system was materially increased. This minimized investment and provided additional capacity in a short time.

GRADUAL DEVELOPMENT of the system of pumps, tunnels, and ocean outfalls serving the Los Angeles County Sanitation Districts has kept the hydraulic capacity ahead of the rapidly increasing flow and minimized capital investment.

The system conveys effluent from the districts' sewage treatment plant to the Pacific Ocean. Three years ago it included 6 miles of 8-ft dia tunnel and 1 mile of 5-ft dia underwater ocean pipeline, capable of carrying 95 mgd when pumping against maximum tide (combination 1 on Fig. 1).

Increased flow in the various districts due to wartime and postwar growth together with addition of new districts that included sizable cities (Pasadena and Long Beach) necessitated additional outfall capacity.

First postwar addition to the outfall facilities involved the construction of a 6-ft dia, mile-long ocean outfall (ENR Mar. 4, 1948, vol. p. 368). This was completed early in 1948 and increased the capacity to 137 mgd at maximum tide (combination 2 on Fig. 1).

Next step in development of the outfall facilities was to be the addition of a 6-mile long, 12-ft dia horseshoe tunnel, roughly paralleling the existing 8-ft tunnel (see Fig. 2). However, there were two considerations working against the immediate construction of the entire tunnel. First of all, the entire capacity was not immediately needed and was not expected to be required for some time. (The new tunnel would double the capacity of the system.)

Significant capacity could be added by building the tunnel in two or more steps and connecting the completed portions to the existing tunnel. This would minimize the immediate investment required and result in a significant saving in interest charges. Under a step-by-step development, much of the cost could be met by current tax revenues and thus less bond money would be required.

However, need for some additional capacity was apparent. Thus, the second consideration working against construction of the entire tunnel was time. It would have taken too long for the entire tunnel job—flow would have exceeded capacity before the tunnel could be completed in its entirety.

Another alternative was construction of a reservoir near the treatment plant to store peak flow of treated sewage. A 70-acre site was available and this could be developed to a depth of 10 ft. This expedient was discarded because it could provide only temporary relief. However, this plant is being kept as an ace in the hole should the flow increase more rapidly than predicted—the building reservoir can

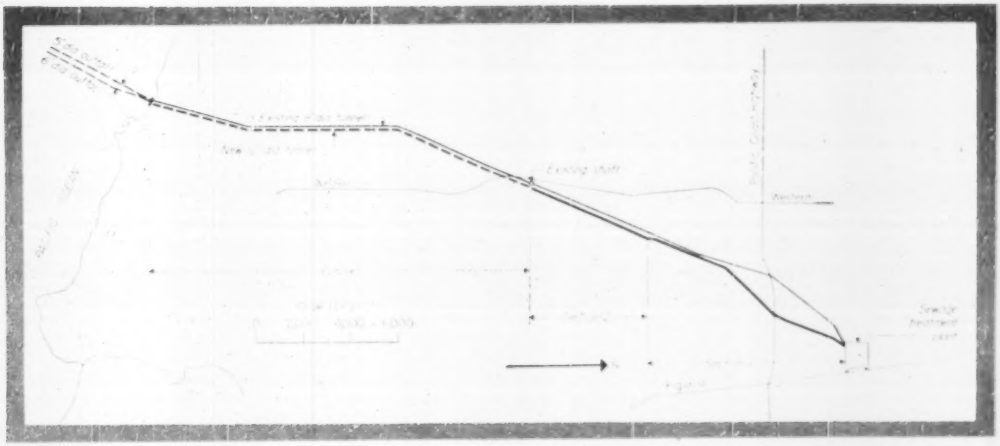


FIG. 2. TUNNELS pierce a 1,500-ft high range of mountains lying between the treatment plant and the Pacific Ocean. Favorable currents disperse effluent, making secondary treatment unnecessary.

be constructed in a short time.

• Two miles built first—The first step was the construction of a 2-mile section on the inshore end of the tunnel (section 1 on Fig. 2). This was completed in July, 1949, and a connection made between the new tunnel and the existing 8-ft tunnel as will be described in the following. Maximum capacity was increased to 152 mgd at high tide (combination 3 on Fig. 1).

Actually, only 5,630 ft of the new outfall section was tunnel. 12-ft dia driven through dry sand. The rest of it (6,044 ft) was 12-ft dia precast concrete pipe laid in open cut. Trench depth varied up to 40 ft.

As soon as this work was completed, construction began on an additional mile of 12-ft dia tunnel. A 160-ft deep shaft built for the construction of the first tunnel was rehabilitated and used for the new work. The shaft is located about midway between the treatment plant and the ocean. This second step will be completed this year (1950) and will increase capacity to 168 mgd (combination 4 on Fig. 1).

Another expedient now under construction is the installation of additional pumping capacity at the upper end of the tunnel. This will raise the plant effluent another 8 mgd, thereby increasing combination 4 capacity from 168 to 182 mgd. This increase is temporary and will no longer be necessary when combination 6 is reached.

Next step in development will be either completion of the entire tunnel (combination 6) or completion of another 13 miles or its length (combination 5). No date has been set for this work. However, it is expected to be within the next 5 years. Then capacity would be available for anticipated growth in the system for 10 or 15 years more. The last step in the development will be an additional ocean outfall, this not to be 7-ft dia (combination 7).

• Tunnel through running sand—

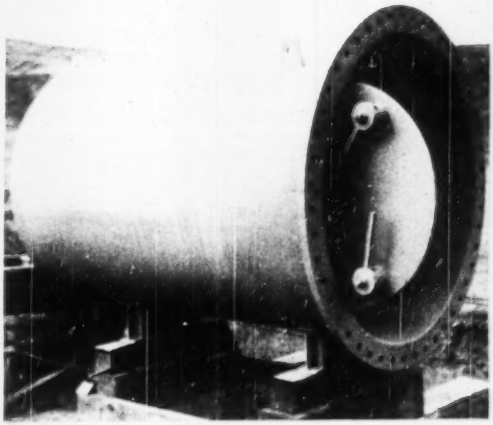


FIG. 4. WHEN MAKING the connection between old and new tunnels this 5-ft dia airlock helped maintain pressure in the crosshaft between tunnels.

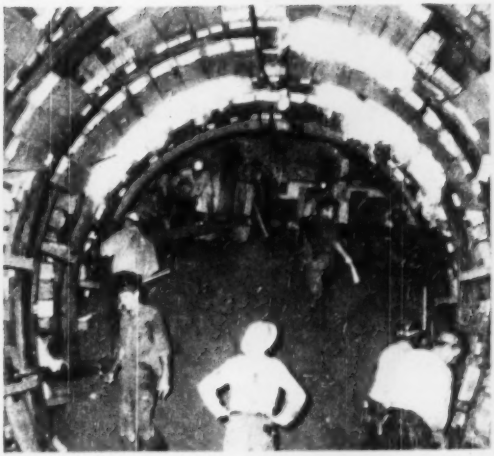


FIG. 5. TO KEEP RUNNING SAND OUT of the tunnel, workmen bulkheaded the tunnel face and pinned excelsior in cracks between exiting wedge-shaped timbers driven over ribs.

Much of the tunnel was driven through running sand. This necessitated the use of steel ribs of 20-lb, 6-in. H sections spaced 4½ ft apart. Timber spiling, 2 in. thick, was driven completely around these steel ribs by pneumatic hammers. To further keep the sand out of the tunnel, excelsior was jammed in all the cracks.

Workmen proceeded cautiously in placing additional sets of ribs lest they lose the face to the incoming sand. First, spiling were driven under the next to last set placed, and over the last. Sand was hand excavated from the top of the tunnel and a partial bulkhead placed at the face. As more spiling were driven, the bulkhead was gradually extended down until another steel rib set could be placed. Then a mucking machine cleaned up the face and the process was repeated.

• **Pumps needed**—A large pumping installation removed water seeping into the sandy part of the tunnel. This is pumped through 8-in. discharge pipes that discharged into the existing 9-ft tunnel. For 4,200 ft where the water problem was particularly bad, a well-point installation was made in the tunnel. Spacing of the 1½-in. dia well points averaged 5 ft. As the tunnel is being concrete-lined, this water will be effectively shut off.

The sand excavation involved about half of the section 2 tunnel-driving. The other half was through fairly dry Altamira shale. For this work two drifters fastened to hydraulic jibs were mounted on a drill jumbo. Because of the jibs, workmen easily positioned the machines to drill the 50 holes required for each round. Then they used 50- and 40-% powder and blasting caps with eight delays to pull 4 ft. Advance in the shale averaged 40 ft a day.

On the first section of tunnel, spoil was hauled out at portal level and dumped. However, for the tunnel worked from the shaft, excavated material was hoisted to the surface in a muck skip.

As the tunnel was dug, utility lines were installed. These included 21-in. dia spiral-reinforced air tubes that could be used either to suck air out of the tunnel or to force air into it. Blowers located on the surface had a capacity of 8,500 cfm. Compressed air lines were also installed. These provided for air at 100 psi for operating pneumatic hammers and spades. Some rock drilling equipment was also involved. Other utilities included fresh water and both 440- and 110-v power lines.

• **Connection between tunnels**—In connecting the first 2 miles of the new 12-ft sewer with the existing 9-ft tunnel, special precautions were required because the 9-ft tunnel was operating under pressure. At the point of connection, center lines of the two tunnels are 20 ft apart and invert elevations differ by 10 ft, the new tunnel being higher than the old one.

• **Connection**—A cross-drift connects at right angles to the new 12-ft diameter tunnel. This chamber was simply a reinforced concrete room with inside dimensions of 8 ft 6 in. by 17 ft 8 in. in plan and a height of 9 ft 6 in. A shaft 5 ft 6 in. dia was driven from this chamber down to the old tunnel. However, the break through had to be made under pressure.

Entryway between the new tunnel and the connection chamber is a 5-ft dia steel nipple. A semi-portable air-lock 8 ft long and 5 ft in diameter was bolted directly to the flange of the nipple. Thus, workmen could enter the airlock, stay until pressure built up, and then enter the connection chamber. Nipples for air connections were cast into the concrete between the tunnel and the connection chamber.

When everything was in readiness for the connection, workmen entered the connection chamber under pressure and gradually chipped out a rectangular hole 3x5 ft, in the top of the old tunnel. Material removed was passed out through the airlock. Air pressure was maintained to prevent the upsurge of water from the old tunnel.

When the hole was finished, the men left the connecting chamber and air pressure was gradually reduced. This permitted excited effluent to enter, but a flap gate prevented effluent from backflowing into the new tunnel from the connection chamber.

A similar plan will be followed this fall when the second section is connected into the tunnel system. However, at the shaft, the two tunnels are 150 ft apart instead of 20 ft and are at the same elevation instead of differing by 10 ft. Thus, it will be necessary to incline the connecting tunnel upward so it will come over the top of the old tunnel.

Then the section of new tunnel already in service will be dewatered—must be during a low flow period so the old 9-ft tunnel will handle the entire flow. Next, the bulkhead at the end between the two portions of new tunnel will be removed. A 48-in. shaft is available to remove bulkhead materials.

• **Second section**—The second tunnel section was holed through in April, 1950. Concrete lining work started immediately and is now under way. First concrete was placed in the invert and work on the arch will follow. This lining work is carried out by pumping transit-mix concrete behind movable forms.

A. M. Rown is chief engineer and general manager of the Los Angeles County Sanitation Districts and C. R. Compton is assistant chief engineer. Fred D. Bowles supervised design and is resident engineer on construction of the new tunnel. N. S. Marchment is superintendent and Richard Gilman is assistant superintendent on the tunnel construction. The work is being done by employees of the districts.

More Space in Low-Rent Housing

More space for eating, sleeping, storage and indoor play is held to be a big need in low-rent housing. Local housing authorities that now have projects under construction or on the drawing board are doing their best to provide it, according to the JOURNAL OF HOUSING, organ of the National Association of Housing Officials.

At least four cities that have already broken ground for new projects or that soon will are including a larger proportion of three- and four-bedroom units than previously built and one is building a project with five bedrooms or more. New Orleans will have 36 three-bedroom and 50 four-bedroom dwellings in a 224-unit project. Atlantic City is building 82 three-bedroom and sixteen bedroom units in a 164-unit project. St. Louis plans 276 three-bedroom, 56 four-bedroom and 12 five-bedroom units in a 704-dwelling project.

Ideas for more suitable living units for low-rent families proposed by management and maintenance personnel of the Louisville Housing Commission include larger master bedrooms to permit crib space for two small children and larger kitchens in four-, five- and six-room apartments so that large families can eat together.

The Committee on the Hygiene of Housing of the American Public Health Association has recommended 400 sq ft of floor space for one person, 800 for two people, 1,000 for a three-person family, 1,200 for a four-person family, 1,450 for a five-person family and 1,850 of space for a six-person family.

Find Out How to Treat Industrial Wastes

IT COSTS A LOT OF MONEY to study your industrial wastes. But it will cost you a lot more if you build a treatment plant without investigating them thoroughly.

This is one big reason for The Atlantic Refining Company's well-equipped waste-control laboratory in Philadelphia. The $105,000 lab, which costs more than $100,000 a year to operate, is a vital link in the Point Breeze Refinery's waste-control organization. This organization includes—in addition to the lab—operating and engineering sections more directly concerned with plant servicing. The O and E sections, however, depend daily on the lab for help in solving waste problems.

• **The lab's job**—The principal functions of the laboratory are: Investigate waste disposal as well as water supply problems; Conduct laboratory and pilot plant research; Recommend corrective measures and procedures; Provide data for engineering design of new and revamped installations; and Train operating employes technically to control waste and water treatment facilities.

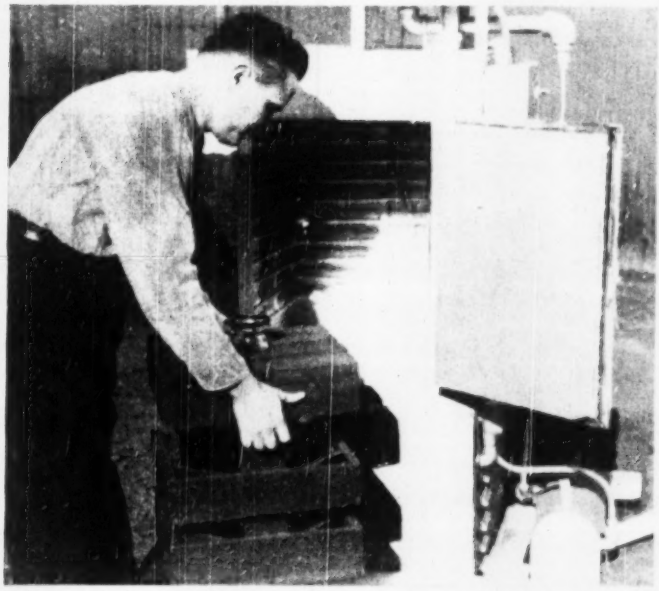
The lab has 5,500 sq ft for mineral and sanitary analyses. It is enclosed in aluminum sheet metal on a steel work frame. Concrete floors are covered with asphalt tile. Ample window space for natural lighting is supplemented by fluorescent lamps. Additional space includes a 500-sq ft bio-assay laboratory and 1500 sq ft of offices and locker rooms.

Utilities provided include: Hot and cold water, steam, air, gas, vacuum, distilled water, refrigeration, oxygen and carbon dioxide. Electric power is both 60-cycle, 110, 220, and 440 a-c and 110 v d-c.

• **Staff**—The waste-control organization consists of 55 employees of which seven skilled chemists and assistants are attached to the laboratory. Waste control is under the general supervision of W. B. Hirt, service superintendent with immediate direction of the three sections by Ros F. Weston, sanitary engineer. Joseph DeMauriani photos) directs laboratory work.

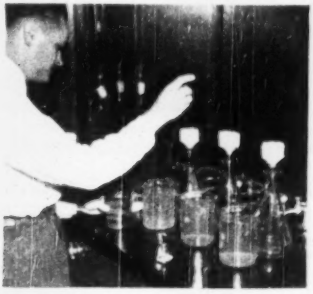
Because the refinery is under consent order by Pennsylvania's Sanitary Water Board to proceed with the construction of a complete treatment plant by the end of 1952, the laboratory is constantly studying waste characteristics and making recommendations for effective, low-cost processing. Some routine tests made in the well-equipped lab are:

Waste waters are sampled automatically . . .



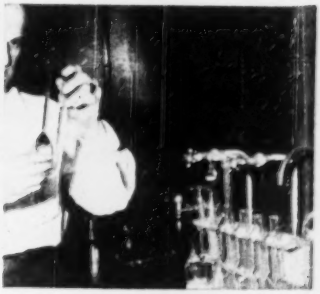
COMPOSITED by a 2-rpm scoop (above unit) and refrigerated during collection, a sample goes to the laboratory for mineral, sanitary and bio-assay analysis.

Oil is removed by flocculation and solvent extracted . . .



1 Added ferric chloride forms a floc that settles with adhering oil. Vacuum filtered, retained floc is dried.

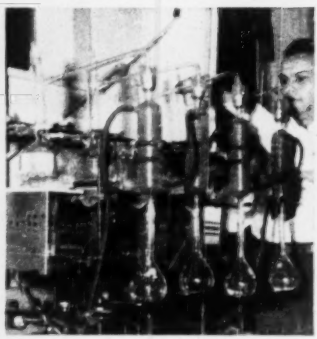
2 Dry floc is put in a crucible and refluxed with a solvent to extract the oil. In a special tube.



3 Solvent is driven off by heating. Oil content is read directly in ppm on the calibrated capillary tube.

Phenolic compounds are distilled off . . .

1 Interfering substances in waste-water samples are chemically flocculated and settled out . . .



2 Phenolic compounds in four samples are distilled off under the chemist's close supervision . . .

3 With color-forming reagent in sample, amount of phenol is measured quickly with a photo electric cell.

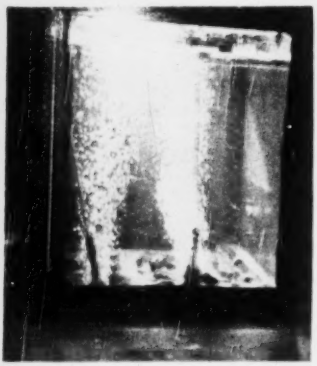
Chemical Oxygen Demand is measured by . . .

1 Digesting samples with iodic acid in Kjeldahl flasks 1 hr at 190 deg C in a constant temperature bath . . .

2 After digestion, samples are put into a large flask with distilled water and steam distilled

3 And finally—chemical oxygen demand is measured indirectly by volumetric titration.

Aquatic-life toxicity tests made in bio-assay laboratory . . .



1 Fish are acclimatized at constant temperature before used in tests.

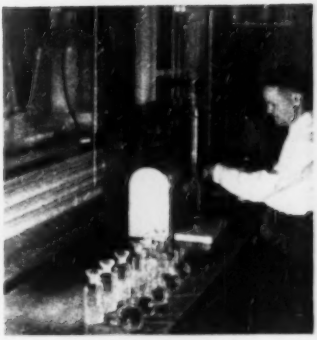
2 Oxygen is fed continuously into diluted wastes under glass funnels.

3 After 14 days in diluted wastes, autopsies are done on fish specimens.

Biochemical Oxygen Demand is determined . . .

1 Reagents added to aerated-aged distilled water yield diluent for BOD tests of waste-sample aliquots

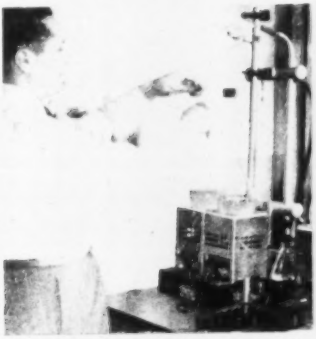
2 Diluent, waste and dilution water are added to test bottles. Samples are incubated at 20 deg C for five days . . .



3 Dissolved oxygen in samples is found by adding reagents and titrating. BOD is figured from DO lost in incubation.

Total Organic Nitrogen is evaluated . . .

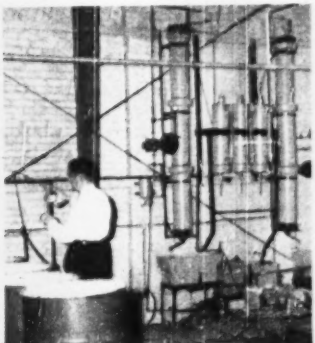
1 The chemist removes samples that have been digested in acid medium for several hours . . .



2 Made alkaline, samples are distilled for ammonia content by the Kjeldahl method . . .

3 Ammonia in aliquots of samples is determined photometrically after direct Nesslerization.

Biological oxidation of petroleum wastes . . .



1 A twin pilot plant can walk processes wastes not chemically treatable

2 Efficiencies of the biological-treatment process range from 60 to 90 percent. The result: A safe effluent and a clear effluent sample.

HAMMER GRAB is both pick and shovel for sinking foundation pier casings. Hole is beneath rig's main sheave, whereas hammer grab is in dumping position below auxiliary arm, which will fold back, to position hammer for digging.

New Excavation Tool, The Hammer Grab Speeds Port Rebuilding At LeHavre

"... reduces foundation costs by 40%, time by 50%"

McGraw-Hill World News

LeHavre, most battered harbor on the European continent, already has regained its place to rank with Marseilles as France's foremost port. This comeback has been made possible by new construction techniques, several of which make use of the "hammer grab," a tool that digs and bucks for foundation caissons.

During the war all 11,000 ft of tidal quays were destroyed and buried beneath sticky tons fallen buildings and revolving cranes. Extensive clearance work and temporary wharf building was done by U. S. Army engineers and LeHavre port authorities after the liberation, but only in 1946 did full reconstruction begin. First, sheds, roadways and railways were brought back into use; then attention was turned to the pier structures themselves.

The new quays are made of prefabricated slabs of prestressed concrete, supported on reinforced-concrete caisson foundations.

Of particular interest is the method of setting the caissons. This is known as the "Benoto process," since the machines used are manufactured by the French excavating equipment maker, Benoto.

• **The hammer grab.** The Benoto process consists of boring and excavating simultaneously with a special tool, the hammer grab—essentially a cylindrical weight on top of orange peel like cast steel jaws that pick the soil when the jaws are wedged in their open position, then enclose a "bite" of soil in their closed position. The hammer grab can be adapted to varying types of soil by a choice of several jaw types.

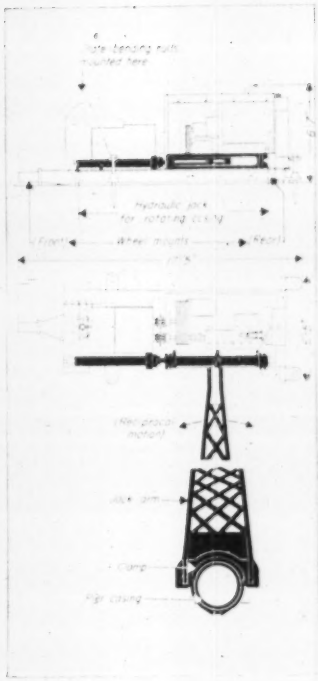
In general, the hammer grab is used in conjunction with a casing. While the ground is being excavated, the casing is simultaneously lowered by its own weight. Sinking may be augmented by a semi-rotary movement, imparted by a machine-operated lever arm attached to the casing's top. This action saves time in setting the casing, which sometimes attains its final position even before excavation is completed. When excavation is terminated, reinforcement is inserted and the casing is withdrawn as concreting progresses.

Boring equipment includes a drilling machine, a combination casing and rotary motion machine, and one or more hammer grabs with series of adaptable jaws.

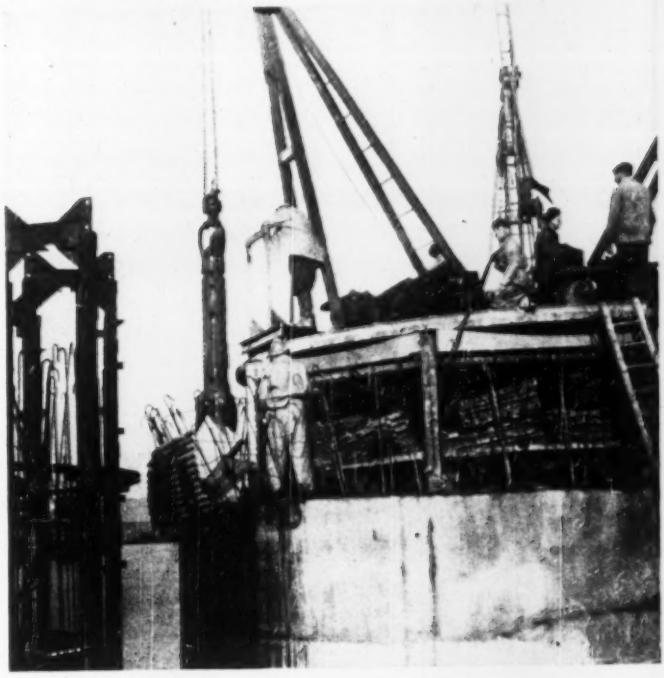
• **The drilling machine** consists of a rubber-tired chassis supporting a diesel-powered sandrum winch. A folding boom is attached to the front of the chassis. In working position, the boom is held in place by two telescopic legs resting on the ground. These legs assure correct spotting, and they support the force necessary for extraction of the casing. An auxiliary boom arm swings the hammer grab away from the hole, for discharging muck outside the hole zone.

• **Casing sections** may be manufactured on the spot. The combination casing and rotary motion machine consists of a set of rolls for bending the sheets, an engine generator for welding, and a hydraulic pump operating a concentrated horizontal jack to which is fitted a collar to clamp around the casing. Movement of the jack is automatically reversed at the limits, or wherever the casing encounters undue resistance. This jack produces the semi-rotary movement.

The combination machine is fixed



CASING MACHINE combines: (1) rolls and welding machine, for manufacturing caisson shell, with (2) hydraulic jack for twisting shell downward into earth.



GABION SINKING—Benoto system rigs rotate on cylindrical concrete caisson, handling hammer grabs that undermine the cylinder's lower edge. Hammer grab's access is through closely spaced circular dredge wells in caisson wall. Structural frame and reinforcing for another gabion shown at left.

firmly to the ground by stakes driven through holes in the chassis. Auxiliary equipment includes pneumatic-tire mounting for easy portability. The casing machine makes tubes of any required diameter. In preparation for driving, a serrated cutting collar is welded to the casing's lower rim.

• **Watertront rehabilitation**—Application of the Benoto process at LeHavre is typified by the work on the Bellot wharf. Built of masonry, it collapsed when the tide locks were destroyed, draining the water from the basin and causing the wall to tilt under earth thrust. (Part of LeHavre's harbor is behind lock gates so that ship-wharf activities can be carried on without inconvenience from the area's great tide range.) Reconstruction on similar lines would have been difficult because of the instability of the ground, so a different waterfront foundation design was adopted.

The new wharf, 1,000 ft long, is set on three rows of 5-ft piers spaced 50 ft c to c. Piers extend 100 to 130 ft, to a thick pebble or gault-clay stratum.

• **Mortar injection concrete**—Fen ft long casing sections of 3-in steel were sunk by the Benoto process, being welded together section by section as they were settled to place. Once bedrock was reached, reinforcement assemblies were inserted in the bottom then aggregates of from in to 2½ in size were fed in by belt conveyor. A grout was then introduced, from bottom to top, as the casings were withdrawn.

Average lining speed was 3.28 ft per hr. It required about 30 hours to bore a 100-ft shaft, 20 hours to place concrete aggregate, extract the casing and inject grout.

The Bellot sections are completed by setting precast slabs on the piers. This work is being carried out by Etablissements Coignet, Bernard and Société de Construction des Batignolles.

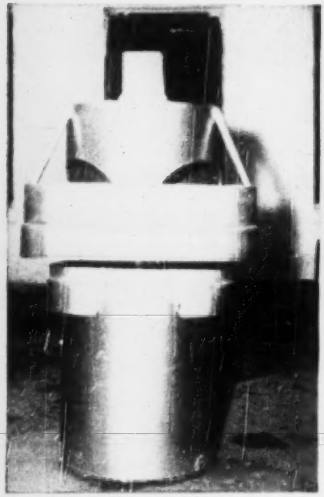
• **Does cylindrical caisson work, too**—A 1,000-ft extension of the Bellot wharf now is being constructed in the same tidal basin. These quays utilize concrete cylindrical caisson piers excavated with small hammer grabs by the Levean Co.

The cylindrical piers, called gabions, are built up in place as sinking proceeds. Dredging wells for the hammer grabs are spaced closely in the gabion's wall, so that the annular space beneath the wall may be excavated by sinking. Well excavation is supplemented by hammer grab work inside and outside the wall. Two or more small hammer grabs work from circular rails on top.

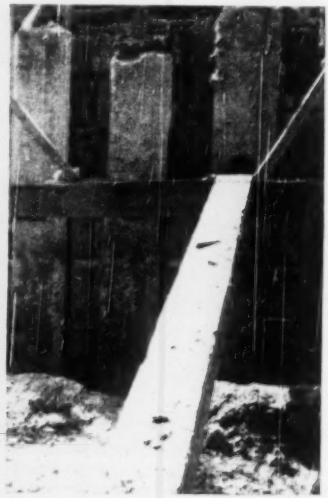
In another part of the harbor, some 600 ft of tidal wharves are being reconstructed by Schneider & Cie. Here the surface in this case was unstable due to undermining and tidal movement, casings of reinforced concrete, to be left in place, were installed by the Benoto process. Like the steel encased piers, the concrete encased piers were filled with aggregate, followed by grout injection.

Reconstruction should be terminated by 1954. Total cost is estimated at $4.4 million. For foundation work, it is estimated that the Benoto process reduces cost by 40 percent, time by 50 percent. Speed in reconstruction is vital, for LeHavre is France's gateway to the Atlantic, and of prime importance for trade with the United States. By 1948, imports, exports and passenger shipping already exceeded the pre-war level by nearly 50 per cent in some categories.

FIELD AND OFFICE



CUTTER BUCKET—Lower portion has trap-door bottom, receives cuttings from projections as assembly is driven into previously bored bucket-size hole. Square-socket head aids driving alignment.



SOLDIER PILES—Reinforced concrete members, placed in cutter-bucket's semicircular holes, were lagged and braced during basement excavation, later became part of 24-in. concrete wall.

Cutter-Bucket Bores Semicircular Holes for Soldier Piles

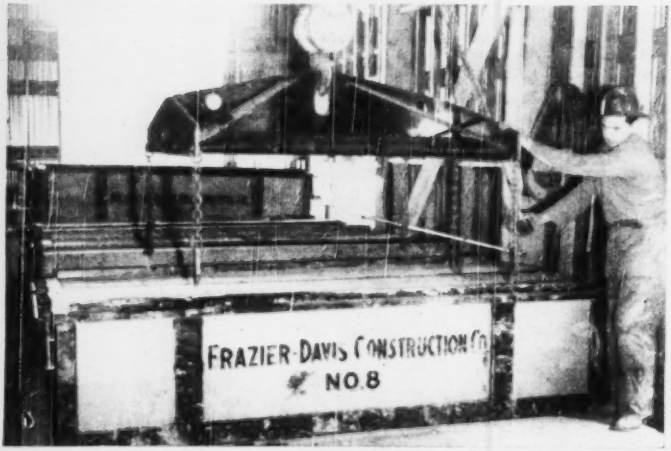
Sure-Bottom Foundation Co., Houston, Tex., is accustomed to boring circular foundation pier holes in the local stiff clay. Recently the company was asked to bore a semicircular hole. Here's how it was done:

A round hole of 18-in. dia first was bored to required depth. Then a cutter-bucket, made for the semicircular-hole job, was set in the hole, for driving with an air hammer.

The bucket (lower portion of photo) is round hole size, has a trap-door bottom. The cutter consists of two flights. The lower flight consists of two curved ears that face rectangular notches in the bucket rim. The upper flight as a built-up plate bent to 200-deg central angle on a 15-in. radius. The plate is tangent with circular bucket at middle of cutter arc; it is tied back into the cover. The upper flight cutter is framed slightly above the bucket. (The resulting hole is not completely semicircular, it will be deduced.) A square-hole driving head receives a square rod, which can be kept from rotating, with a square-hole collar, so that the hole will be true throughout driving.

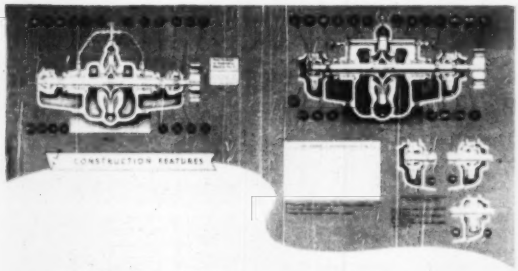
In driving, the lower flight makes a pilot cut and the upper flight completes the job, both shearing clay and forcing it inward, to drop into the bucket. When the bucket is full, it is withdrawn, emptied and replaced for further driving.

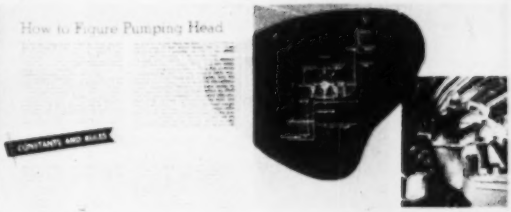
Sure-Bottom drove 156 of these holes, ten a day, for Tellepsen Construction Co., contractors for Houston's new Sakowitz store. Used to form reinforced concrete "soldier piles," they were spaced at 42 in. along the foundation wall lie. The soldier piles were lagged and braced during basement excavation, eventually becoming structural parts of a 24-in. retaining wall around three sides of the building.



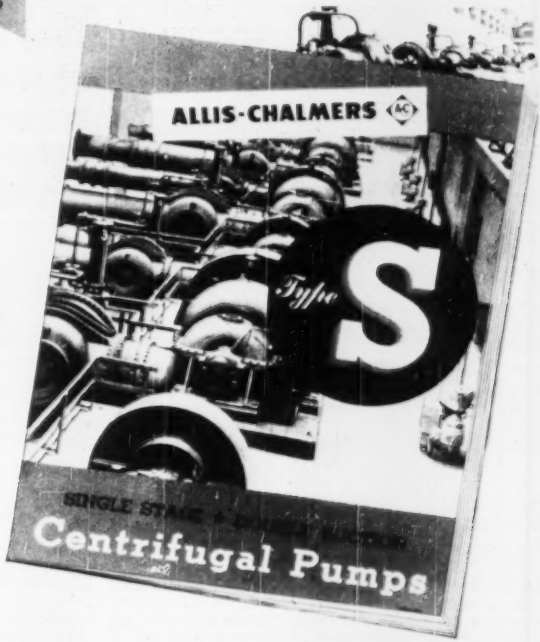
HANDY BATTERY HANDLING—For quick transfer of locomotive batteries powering haulage for Neversink Tunnel work (Cuddebackville, N. Y.), Frazier-Davis devised this hoisting yoke in their battery-charging house. Five-ton hoist travels on beam, holds yoke that remains level as operator lowers away for four-point pick up with . . .

EASY ENGAGE HOOKS—When hooks reach slightly past slots, operator inserts hooks' downward projections, then hoists. Hooks engage automatically. (ENR photos)





How to Select and Apply Pumps



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READER COMMENT

Engineer Takes a Hand

Sir: It may interest you to know that Fred Ohrt, manager and chief engineer of the Board of Water Supply, was elected a delegate to the Hawaii State Constitutional Convention on March 21. A candidate from Hawaii's Fifth Representative District, Mr. Ohrt led a field of ten by a margin of 1,758 over the second contender. Five were elected. Mr. Ohrt received 15,823 of a total vote in the District of 30,102.

The convention was organized April 4 for a sixty-day session to draft a constitution for Hawaii, which is now awaiting action by the U. S. Senate on its bid for statehood. The House of Representatives has already approved admission of Hawaii to the federal union as a state.

Here in Hawaii the Constitutional Convention looms as a very important milestone in our historical progress towards ultimate achievement of full statehood in the union. Only those who have been faced with the problem of drawing up a state constitution can appreciate the ramifications of such a document and the fundamental importance of including adequate and proper provisions to insure the rights of the people and spell out the duties and responsibilities of the various branches of the government.

We, as engineers, are pleased to have Mr. Ohrt serve in this convention and are sure he will do an excellent job. Mr. Ohrt, in this case, is the exception to the usual rule where engineers are prone to leave political matters to members of other professions.

L. H. HERSCHLER
Sanitary Engineer
Board of Water Supply
City and County of Honolulu

Safety in Prestressing

Sir: Reference is made to your editorial, "Safety Factor for Prestressing" published in ENGINEERING NEWS-RECORD April 13.

At present, primary interest and efforts concerning the economy of prestressed concrete are the applications of this type of construction to American methods. The economy of this construction is lost when European methods are transferred to this country.

In regard to the design safety factor, it is not generally known that our present AASHO design loads do not contain a safety factor. In fact, in some states, the legal limitations of truck loads permit heavier moment-producing vehicles than the present H20-S16 loading. To be comparable with our present design in both concrete and steel, we should use at least 1.8 live loads in prestressed concrete before cracking takes place. The basis of this reasoning is that structures built according to our present design will take at least that much overload before the yieldpoint of the material is reached. In many cases of concrete beams, the yieldpoint is not reached until 4 or 5 live loads have been applied due to the reserve strength acquired by our low unit dead-load stresses.

One point that should not be overlooked is that after the prestressed concrete beam does crack, it does not act as a homogeneous material. Therefore, the stresses may be higher than calculated unless this is taken into consideration.

Consideration should be given to the fact that prestressed concrete does give a material superior to ordinary concrete. However, I do feel that we should proceed rather cautiously in setting up the design procedures.

Why is it that we develop new procedures and designs on an ultimate design basis and still maintain the unit stress basis in our presently used design methods? The economical consideration cannot be fairly made unless we proceed on the same basis of design.

RAYMOND ARCHIBALD
Bridge Consultant,
Bureau of Public Roads
Chairman, Bridge Comm., AASHO
Washington 25, D. C.

Correcton to Beam Formula

Sir: On p 46 of the April 6 issue, the formula for equivalent S should read:

$$Equiv\ S = \frac{S}{50} L \times \frac{d}{bt}$$

where L is span in feet and S on the right-hand side of the equation is the section modulus required if the beam were laterally supported.

For a flexural working stress of 20,000 psi, the above formula can be written thus:

$$Equiv\ S = \frac{M}{833} L \times \frac{d}{bt}$$

where M is the bending moment in foot-kips.

M. V. PREGNOFF
Hall & Pregnoff
San Francisco 5, Calif.

Raymond MAKES 5 TYPES OF CONCRETE PILES

1. STANDARD . . . 2. STEP-TAPER . . .
3. PIPE STEP-TAPER . . . 4. COMPOSITE
5. GOW CAISSONS

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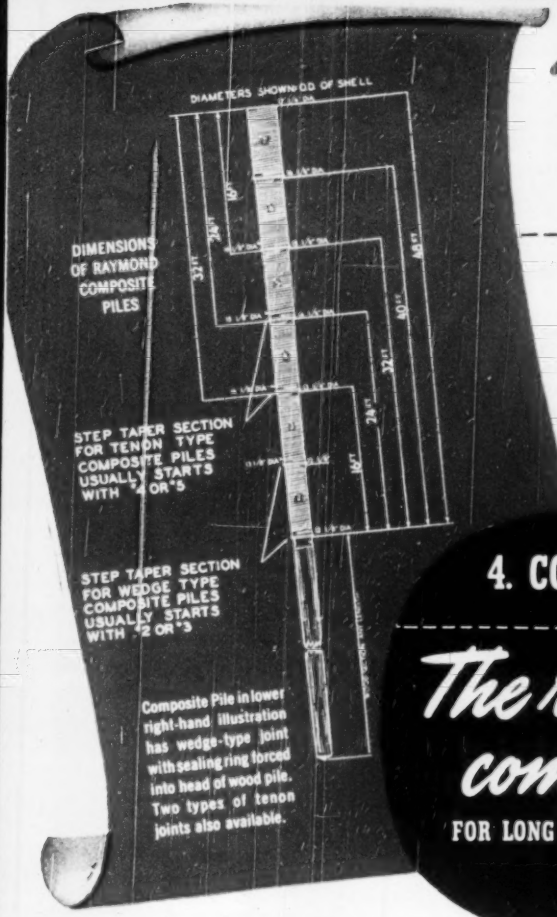
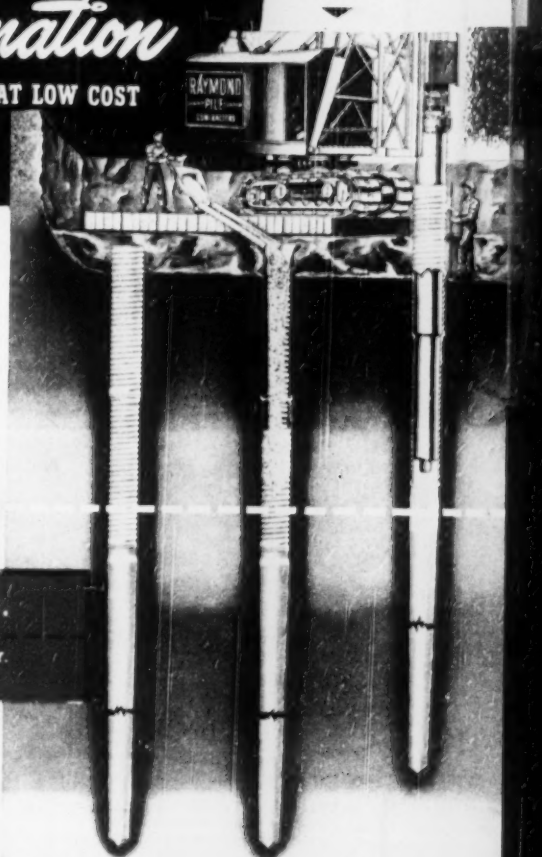

DIAMETERS SHOWN O.D. OF SHELL
DIMENSIONS OF RAYMOND COMPOSITE PILES
STEP TAPER SECTION FOR TENON TYPE COMPOSITE PILES USUALLY STARTS WITH #4 OR #5
STEP TAPER SECTION FOR WEDGE TYPE COMPOSITE PILES USUALLY STARTS WITH #2 OR #3
Composite Pile in lower right-hand illustration has wedge-type joint with sealing ring forced into head of wood pile. Two types of tenon joints also available.

4. COMPOSITE PILES

The right combination

FOR LONG LENGTH AT LOW COST

Right, driven wood pile is being followed down by pile shell of concrete and an A-frame, complete pile driver for maintaining pile shell in being filled with concrete. Point, wedge-type with sealing ring, is below ground-water level. Completed pile is shown at left.



Raymond Composite Piles are used for economy and long length. The concrete upper section extends from the permanent water table up to the underside of the footing, thus eliminating the expensive excavation, sheeting and pumping often required with wood piles.

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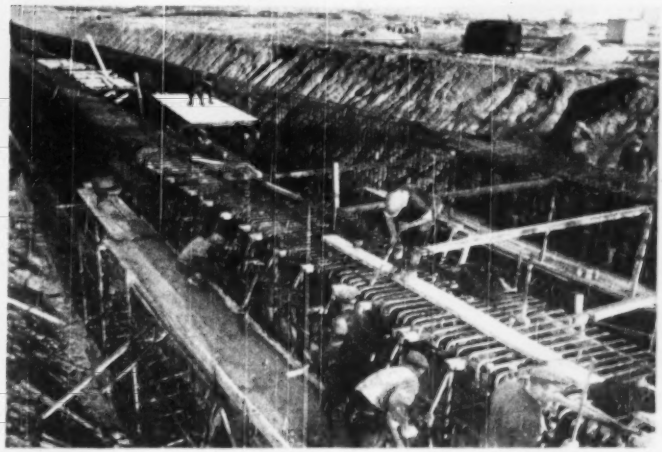


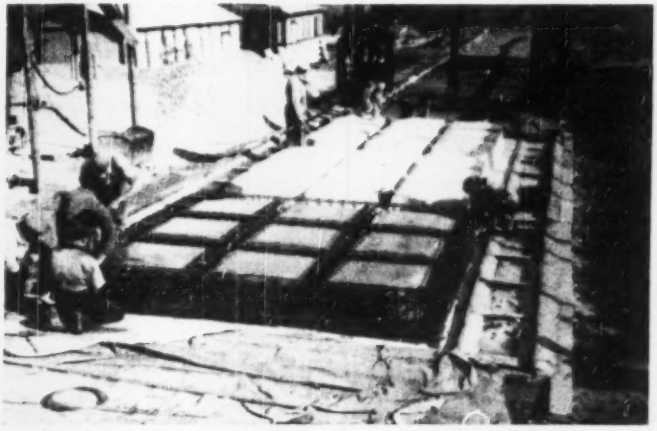
AIRPORT TRAFFIC TUNNEL—Workmen are living concrete in one of four traffic tunnels running to the center of the new London Airport. The tunnels will carry all vehicular traffic while aircraft taxi and fly overhead. The air field, one of the few big enough to handle the new Bristol Brabazon airliner, is already in regular use by civil airlines. (Eastern Pub. Service photo).

Belgians use new process in building reservoir

Engineers for the city of Brussels, Belgium, recently completed construction of a 100x120-ft x 12-ft concrete reservoir just outside the city, using vacuum processes for the work.

Methods used: The column footings and the floor were cast first. Then 80 columns, 12 in. in diameter and flared to 2 ft at the bottom by 18 in. at the top, were cast. These columns were cast with only two vacuum-lined steel forms held to the floor by vacuum. External vibration was done by a very small vibrator affixed to the forms by vacuum. The forms were removed half an hour after the concrete was poured, and used five times each day.

The 12-ft outside walls were cast similarly. Roof slabs were ribbed, cast in concrete molds, vacuum processed and then lifted and set in place on the columns. The roof, incidentally, was figured for a load of 500 lb per sq ft because it is to carry 30 in. of



CONCRETE MOLDS—Pictured are 12 x 12 ft precast roof panels for the concrete reservoir at Brussels, Belgium.

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The wires attached to the top of the outside walls and run between the precast roof slabs to the opposite walls were prestressed by the Magnel-Blaton system. Only two heavy wires, with 12-ft spacing, were used for these ties.

A. Veltem is chief engineer for the Campagnie Intercommunale Bruxelloise des Eaux, builders. The vacuum work was done under supervision of Jacques Arts, engineer of Syndicat Vacuum Concrete in Brussels.

Brazilian Pipe Line

A pipe line, to cost the government of Brazil about $7,500,000, is to be laid to link São Paulo with the petroleum refinery planned on the outskirts of the port of Santos. The length of the line is about 92 miles.

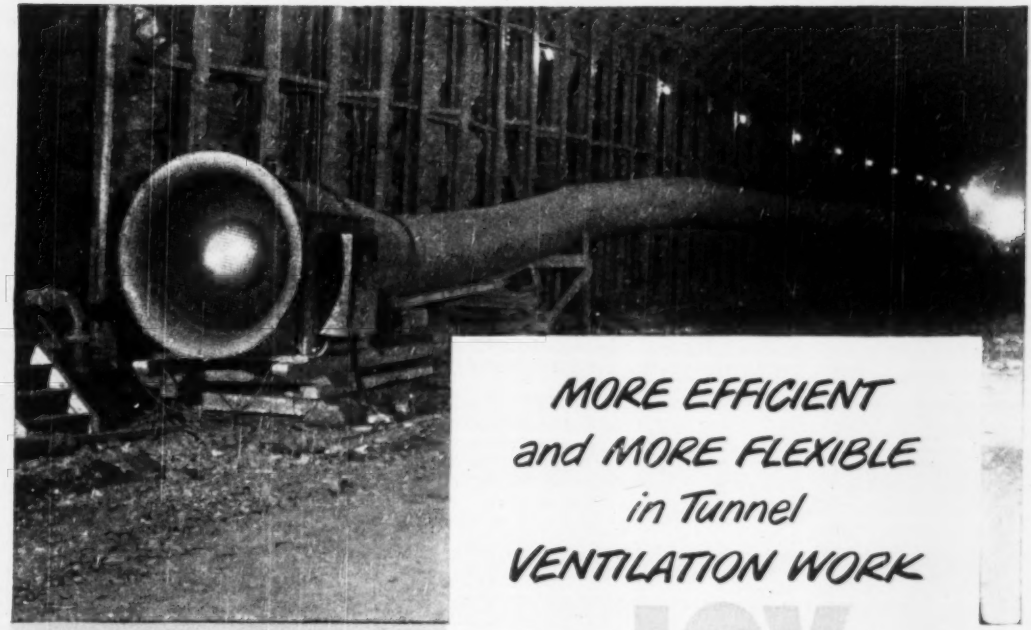
According to Leopoldo Miguez de Melo, engineer for the National Petroleum Council, there will be two parallel tubes—one 10 in. and the other 18 in. in diameter. The smaller one is for gasoline and kerosene, the larger one for heavier oil products.

Bridges

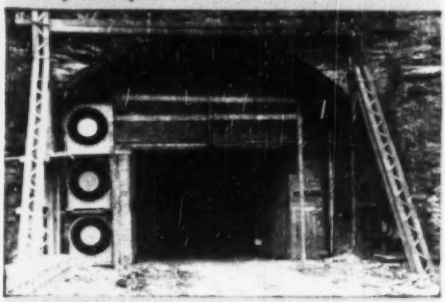
Scotland—An aluminum bascule bridge has been ordered for Victoria Dock, Aberdeen, by the Aberdeen Harbor Board from Head Wrightson Alcem Ltd., a subsidiary of Head Wrightson & Co. Ltd., of Thornaby-on-Tees, which designed and built a similar bridge across the entrance to Hendon Dock at Sunderland on the River Wear in England. Clear opening of the bridge will be 70 ft. Work will start at once and require two years for completion.

Siam—The Royal State Railways of Siam have placed a contract with the Cleveland Bridge and Engineering Co. Ltd., Darlington, England, for the construction of three bridges. Arrangements have been made for Dorman Long and Co. Ltd., to carry out all the work in Siam. Cleveland Bridge Co. will fabricate and deliver all steel work.

Start Puerto Rican dam—Work began this month on the Loiza River Dam in Puerto Rico. It will be a concrete gravity type structure about 700 ft long, with spillway crest 60 ft above river bed. Reservoir capacity will be 6.5 billion gallons. Contract for the dam is held by Sumner S. Sollitt & Co., Chicago. It is expected to be complete in 1952. The dam will provide more water for metropolitan San Juan, adding 30 mgd to the present supply. Cost of the initial project is about $8,000,000.



In this tunnel job, a JOY AXIVANE Fan blows air to the face through lengths of flexible Spiratube.



Typical exhaust set-up—three JOY AXIVANE Fans mounted in the entrance of one of twin bores.

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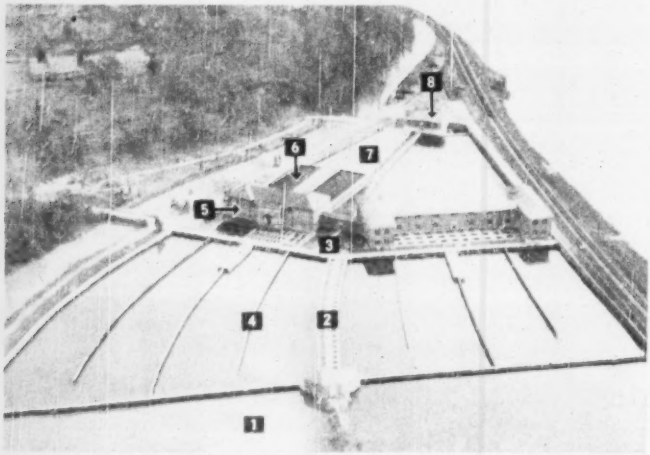


WATER PURIFICATION PLANT—A new water filter unit for Richmond, Va., was dedicated recently. The picture above shows both the old plant and the new addition. The elements are as follows: 1—settling basins; 2—canal; 3—mixing basin underneath grass; 4—coagulating basins; 5—concrete canal; 6—filters—indoors in old plant, outdoors in new; 7—aerator basin; 8—lime house.—Cavalier Photo

City planning—large and small

Two major city planning programs—one involving a multimillion-dollar development of the Port of Baltimore, Md., the other concerned with the healthy growth of Rapid City, S. D.—were made public last week.

Of the two, the Baltimore program, sponsored by the city's Association of Commerce and city commission, appeared more likely of fruition in the near future. Engineers for the Rapid City project admitted that the small city's present population (20,000 people) will have to increase substantially before much of the proposed improvements will be needed.

In Baltimore, the Sam Yens City Consulting Engineers (Chicago, Ill.) and Coverdale & Colpitts (New York City) have recommended that the city create a Port Development Commission with powers to operate the port and its facilities and to give it other administrative functions, as opposed to the present commission, which has no actual administrative duties.

For Rapid City, which has hopes of growing to a 250,000 population within the next fifty years, A. C. Godward, Municipal consulting engineer, has suggested to city officials changes in zoning regulations, construction of new bridges for the city, interstate and national highway routes that traverse the city, proposed mass transportation facilities, and other improvements.

Huge housing projects

St. Louis, Mo.—A [illegible] Parker Dickson Co. [illegible] Pruitt-Igoe Apartments, [illegible] Area 24-A, bounded by Cass Ave., Area 24-B, bounded by Hadley St., Area 24-C, bounded by Carr St., and Area 24-D, bounded by Hogan St. Plans call for 24 three-story buildings in 12 groups for the 821 apartments. The buildings will be of brick and concrete construction with flat roofs. Each apartment will have a private entrance, and there will be no elevators. Each apartment will have a living room, dining area, kitchen, bath, and two bedrooms. Heating will be by gas. Parking space for 441 cars will be provided.

Boston, Mass.—Eugene M. Greenhut, of New York, has a $225,000,000 housing plan for what is known as the Gov. Peter Sharp section of Dorchester. Mr. Greenhut and his attorneys, representing the Urban Redevelopment Corporation of New York, have had several meetings with Boston Housing Authority officials, who are said to be divided on the matter. The principal issue is the legality and feasibility of the project, which would house about 25,000 families.

The main question seems to be can Boston afford such a huge development which would mean the issuance of tax-exempt bonds to be purchased by private investors? Proposed rentals would range from $55 to $75 a month.

Municipal Briefs

Building code revision—Has state building code of Connecticut is to be revised and probably will be changed so that small towns can adapt it to their local conditions and conditions.

A $100,000 leak—The City Planning Commission of Richmond, Va., has recommended an expenditure of $100,000 to stop the wasting of water in the Byrd Park reservoir. When last measured, the leak amounted to about 500,000 gpd. A new lining for the reservoir is expected, according to utilities department engineers.

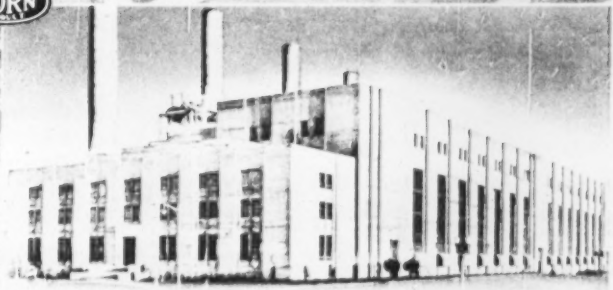
Small boat harbor—Revised plans for the Los Angeles small boat harbor at Marina Del Rey have been forwarded to Washington for congressional approval of funds for use by the Corps of Engineers in dredging the harbor at the mouth of La Ballona Creek. Mayor Fletcher Bowron forwarded the proposal to the Chief of Army Engineers, urging his support, and the county board of supervisors earmarked funds for land purchase. The new construction plan, approved by the city council and city planning commission, provides for building the harbor in three phases. The first would provide facilities for 2,000 boats.

Truck parking lot—Chicago's first opened at 2401-2557 South Aveland Ave., the first exclusive motor truck parking lot. It will have a capacity of 450 tractor trailers and will take 45 percent of that type of vehicle off the streets. The lot is the first phase of a program designed to speed the flow of traffic through the Loop area especially.

Cambridge water improvements—To its water supply system, $6,500,000, are being planned by Cambridge, Mass. Water mains laid 54 and 72 years ago will be replaced. Coagulation and sedimentation facilities of the filtration plant established in 1926 would be separated for greater efficiency.

At a Resort City

In a Southern City



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"Rubbing costs reduced, grain raise eliminated."

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More re-uses of forms especially on exposed concrete work.

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Leaves smooth concrete surface, reduces cost of staining.

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CLEAN, DUST-FREE FLOORS *at reduced cost*

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MEN AND JOBS

Ray E. Murray has been appointed project engineer by the Chicago Land Clearance Commission, authorized by state law to raze slums for housing redevelopment by private enterprise. He held a similar position with the architectural firm of Skidmore, Owings and Merrill, and worked as a construction engineer on its project at Oak Ridge, Tenn.

Col. Robert E. York, now stationed in Japan, is expected to return soon to become Army district engineer at Fort Peck, Mont. **Lieut. Col. E. J. Gallagher** is acting district engineer.

Harold O. Egeberg and **Herman R. Horn**, both formerly with the Army Corps of Engineers, have been assigned to the Region 6 project planning branch of the Bureau of Reclamation. Egeberg previously had been an engineer with the Butte & Superior Mining Co. and had worked for Silver Bow County, the Montana highway commission, the state water conservation board, and the U.S.

Mike Dykum, superintendent for E. H. McGraw & Co., and W. H. Dodge, right, resident engineer for Russell & Axon, consulting engineers for Ocala, Fla., sewage treatment project, are getting a good job done fast.

E. B. Perrin, right, vice-president of the Virginia Engineering Co., Inc., of Newport News, Va., is congratulated by Col. E. F. Gesler, North Atlantic Division engineer for the Army Engineers, for the expeditious completion of the 320-bed Veterans Hospital at Wilmington, Del. On March 19, 1948, the groundbreaking took place. Two years and two days later, March 21, 1950, the hospital was finished, all equipment installed, and patients hospitalized.

STANDARD ENGINEER'S REPORT

DATA

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UNITS: 148 Diesel Engines

CONDITIONS: Heavy-duty service 24-hour operation

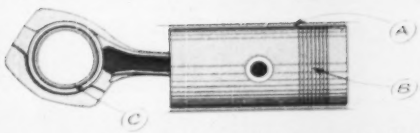
PERIOD: 13½ months

JOB: L. A. Airport Extension

Engine-cleaning oil cuts "down time" in half!

LUBRICATED WITH RPM DELO OILS, more than 100 heavy-duty engines like these were pushed to full capacity around the clock. They finished the greatest earth-moving project in the West 150 days ahead of schedule! RPM DELO Supercharged Oil kept parts lacquer-free and reduced wear so that time out for repairs was reduced 50% under that necessary when using ordinary heavy-duty oils.

How RPM DELO Oils reduce wear, retard oxidation in Tractor, Truck, and other Heavy Duty Engines



A. Contains special additives that provide metal-adhesion qualities . . . keep oil on parts whether hot or cold, running or idle.

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C. Special compounds stop corrosion of any bearing metal and foaming in crankcase.

HEAVY-DUTY DIESEL AND GASOLINE EQUIPMENT, owned by 8 contractors, moved over 12,000,000 cubic yards of earth on this cut and fill job—an extension to the Los Angeles Airport—in 13½ months! General Contractors are W. M. Ball & Sons, Berkeley; Harms Bros., Sacramento; H. Earl Parker, Inc., Marysville. Subcontractors, Lewis A. Queen, Fresno; Louis Biasotti & Son, Stockton; Baker Bros., Chico; Gunner Corp., Pasadena; and Far West Construction Co. All used Standard Oil Company of California products 100%.

REMARKS: RPM DELO Oils are designed to meet every heavy-duty engine need: RPM DELO Heavy Duty, RPM DELO Special, RPM DELO Supercharged-1 and RPM DELO Supercharged-2 Lubricating Oil.

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Shown digging a 6' deep by 40" wide pipeline ditch between Blythe and Santa Fe Springs, Calif., this Buckeye ditcher has four working speeds, transmits power to the digging wheel through a Twin Disc Power Take-off.

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Watch the blades of this ditcher dig into the shifting desert surface—raising a cloud of powdered sand. That swirling cloud contains millions of gritty particles that give machinery the acid test every hour, every day on the job.

And one of the most vulnerable spots on any machine—whether it runs in the desert or in less severe surroundings—is the point where power must be transmitted from engine to driven parts. That's why so many leading manufacturers and users of heavy-duty equipment depend on Twin Disc Power Take-offs to deliver the power.

Twin Disc Power Take-offs, with 31 years of specialized power transmission experience built into them, combine a complete clutch power take-off assembly with shafts and bearings, mounted in a rigid, fully enclosed cast iron housing. Bearings, shafts and all other parts are designed to insure maximum life under the severest operating conditions.

A good power link is easy to forget. Make sure that your construction equipment comes with a Twin Disc Power Take-off. For complete information on Twin Disc Power Take-offs and Reduction Gears, write for Bulletin 129-C. TWIN DISC CLUTCH COMPANY, Racine, Wisconsin (Hydraulic Division, Rockford, Ill.).

SPECIALISTS IN INDUSTRIAL CLUTCHES SINCE 1918

Engineering department at Seattle, and before going to Billings was employed by the Army Engineers Corps at Walla Walla, Wash. Horn formerly was employed by the Iowa highway commission, the U. S. Department of Agriculture, the U. S. Engineering office and the Army Engineers.

B. V. Bevier is water superintendent in Salem, Ohio. He is a graduate of Ohio State University and was with the Ohio Department of Health as designer, construction superintendent of sewer and water projects, and public relations director, from 1924 to 1946. He was sanitary engineer for Mansfield, Ohio, from 1946 to 1949.

Preston L. Lite has resigned from the California State Division of Highways after 32 years. He had been senior highway engineer since 1931. He was district engineer for the National Commission of Roads of Mexico in 1925-26.

Rudolph G. Bessette, New Bedford, has been appointed director of the waterways division of the Massachusetts Public Works Department.

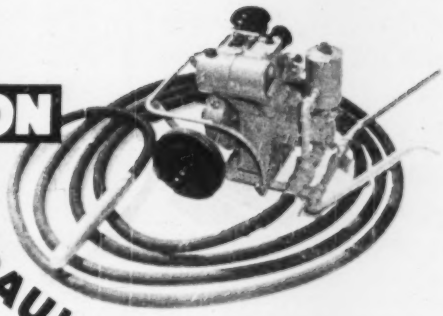
Roy S. Barton, who has completed 42 years with the N. Y. State Department of Public Works, has been appointed field representative for the N. Y. Good Roads Association for the counties of Broome, Chenango, Delaware, Otsego, Schoharie, Sullivan, Chemung and Tioga.

Frederick A. Thiessen, civil engineer and assistant New York State highway general since 1946, has retired after 47 years of state military service. A civil engineering graduate of Rensselaer Polytechnic Institute, Colonel Thiessen was employed more than 20 years with the Delaware & Hudson Railroad.

Charles R. Peirce has been appointed secretary of the Maryland State Roads Commission. Mr. Peirce succeeds Mr. the late Thomas H. Sherwood, who died in January. Mr. Peirce has been assistant secretary for more than 10 years.

Everett Landam has resigned as Delaware County, Ind., highway engineer to become a consulting and contracting engineer at Muncie, Ind., with offices in the Landam building.

John P. Shannon, Covington, Ky., roadside improvement engineer, Kentucky highway department, has resigned. He will become landscape architect for the Baltimore County Planning Commission at Towson, Md.



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Has a 50 ft. REACH-

IS IDEAL FOR GENERAL CONSTRUCTION

Makes hard-to-get-to places readily accessible. Saves much time by eliminating most of the vibrator re-locations usually required. Oil-powered, gas-engine hydraulic pump, trouble-free drive. Engine, 7 HP. 4,000 to 7,000 VPM. Vibrator head 2¾" x 21". May be quickly fitted with head for wet or dry rubbing. Most reliable and convenient concrete vibrator made for general construction.

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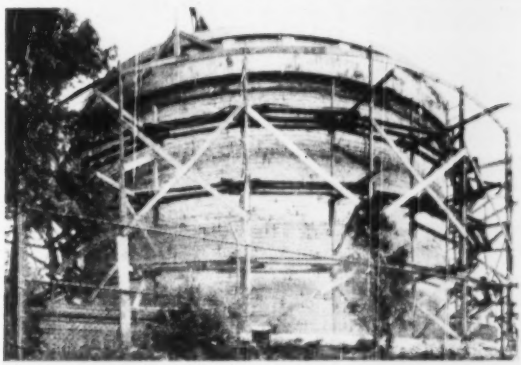

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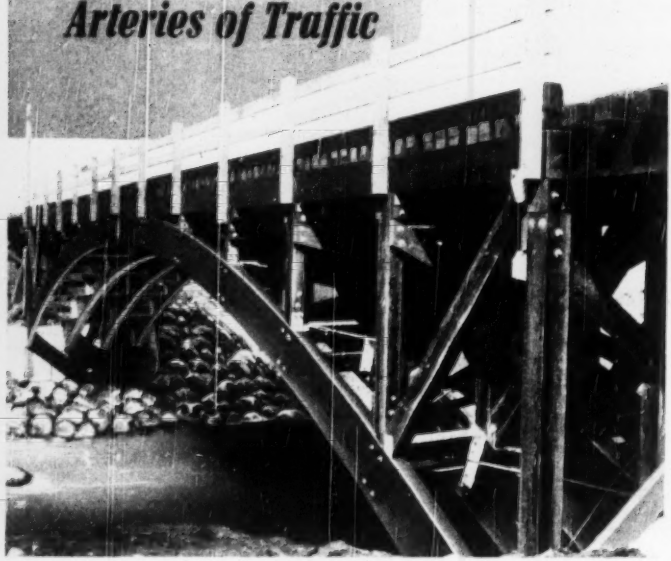
MANUFACTURERS OF THE CEMENT GUN

Muscle of Timber for Arteries of Traffic

Timber arch bridge built for Bohemia Lumber Co. over Culp Creek, near Eugene, Ore.



Years of heavy rail and truck traffic will be only good exercise for the timbers that form the muscle of this 120-foot bridge.

Supporting the weight of the bridge are four graceful arches formed by glued lamination of kiln dried Douglas fir planking and pressure treated with creosote to give lasting protection against vermin and weather. Stronger than sawn timbers of equal size, these arches will never shrink, twist, warp, check.

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To assist in designing and detailing timber bridges to fit all local conditions, a complete engineering staff is maintained. Your inquiries are invited. See the Timber Structures office nearest you, or write directly to us.

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L. D. Shuman, chief of the Operations Division in the Philadelphia district of the Army Engineers, is retiring after 46 years of government service, including 41 years with the Army Engineers. His first assignment was on port improvement in Manila. In 1909 he became connected with the Philadelphia Engineer district as junior engineer in charge of surveys on the Delaware River. He had an important part in the deepening of the channel of that river and its tributaries, and in the improvement of other rivers and streams. During the First World War he was district engineer of the Philadelphia office.

J. E. Williams, Industrial Extension Service instructor of Texas A. & M. College, has been made superintendent of the city waterworks department at San Angelo, Tex.

Assistant City Engineer **Robert Alden** of Regina, Sask., has resigned after 43 years service.

John B. Allen has opened a Northwestern office in San Francisco for the James L. Barnes Construction Co., Logansport, Ind. He is general manager for the territory, having moved up from assistant in Barnes' Los Angeles office.

Walter E. Riley and **Frank J. Foltz** have organized a consulting engineering firm in Phoenix, Ariz. Riley previously was on the engineering staff of the Pittsburgh-Des Moines Steel Co.

Donald R. Hanson of the planning division of the Chicago Housing Authority, has been named executive director of the newly organized Indianapolis Housing Authority. He is a graduate in civil engineering from Purdue University. During the war he was a captain in the Army Engineering Corps.

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Fast-moving, hard-working . . . the Maintainer handles *more* jobs

Faster-on-the-job, the FWD Maintainer covers ***more*** miles per day . . . creating unmatched savings in time and money. Maintaining at 1 to 12 mph, finishing at speeds up to 20 mph, it keeps your roads in best possible condition. Travel-speed up to 42 mph cuts time to and from work . . . broadens the Maintainer's daily operating range and permits more actual on-the-job service. Write for full facts—or see your FWD distributor.

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Regulate the weight by adding or removing ballast — to fit the load.

"... Plenty of horsepower..."
Ample power for heavy cuts and ice and snow removal.

"It does more jobs per equipment dollar"
Hauls, tows, plows snow — does over 60 different jobs economically.

"... It's got the traction I need for a better job"
Four-wheel drive distributes the load — for better cutting, leveling, compacting.

America's Foremost Heavy-Duty Truck

THE FOUR WHEEL DRIVE AUTO CO., CLINTONVILLE, WIS., Canadian Factory: KITCHENER, ONTARIO • World-Wide Sales and Service

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NO SLAMMING!
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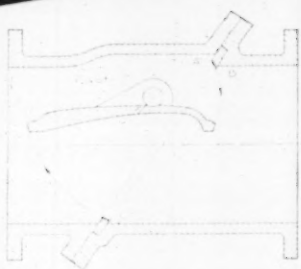
There's no slamming of the disc with Chapman Check Valves . . . no troubles with water hammer. And that means . . . no pipe line vibration, no danger of opening up joints. It's truly the valve with *cushioned closing.*

No wonder Chapman Tilting Disc Check Valves are noted for reducing maintenance cost. Noted, too, for effecting savings of from 65% to 80% in head losses over conventional type check valves. Why not write today for engineering data?



Cross section of the Chapman Tilting Disc Check Valve illustrating the way that the balanced disc is supported on the pivot, with arrows showing the travel of the disc. A feature of the design is that the disc seat lifts away from the body seat when opening, and drops into contact when closing, with no sliding or wearing of the seats.

The Chapman Valve Mfg. Co.

INDIAN ORCHARD, MASS.

EDUCATION and RESEARCH

AT SECOND ANNUAL CONFERENCE on street and highway problems held recently in Los Angeles by the University of California's Institute of Transportation and Traffic Engineering, R. H. Baldock, left, Oregon state highway engineer confers with R. A. Moyer, research engineer with the institute, and chairman of the Highway Research Board, National Research Council.

Special courses

For building inspectors—The school of engineering and the technical extension division of Purdue University, together with the Midwest Conference of Building Officials and Inspectors, recently sponsored a three-day school for building inspectors. Among the subjects discussed were: Administrative procedures; individual water supply and waste disposal; soil properties and footings; design of concrete mixes; materials testing; building materials; zoning; occupancy; air pollution; and safety measures.

Measuring air masses—The influence of topography in the diffusion of air contaminants is undergoing study in the engineering department of the University of California at Los Angeles with the aid of an instrument called a shear meter. Designed by H. E. Poppendiek and J. E. Vollrecamp of the research staff, it measures the drift force air masses exert on the earth's surface. Terrain features of the area under study are reproduced in miniature on a base floating in a tank of water, and drag forces are measured by means of sensitive coil springs attached to the model. Poppendiek said theories attributing atmospheric turbulence and terrain features to pollution dispersion would receive thorough investigation and scientific cataloging as a result of the experiments.

Study chert aggregate

According to Bryant Mather of the concrete research division, Waterways Experiment Station, Jackson, Miss., there are many important unsolved problems concerning the composition, origin and use of chert even though it is one of the most common materials in gravel deposits in many states. Chert is a massive, dispersed, general or neutral or dark color, closely allied to flint.

Mr. Mather told the Earth Science section of the Mississippi Academy of Science that, as part of the civil works investigation of the Corps of Engineers, an intensive study is being made of the nature of the material in various chert gravels. The study may explain why some concrete made with chert aggregate gave unsatisfactory service while other concrete made with apparently similar chert has been entirely satisfactory.

As a result of this investigation, it is expected that the Corps of Engineers will be able to develop tests that will permit the making of high quality concrete from certain low cost chert aggregates which at present are regarded as unsatisfactory. If this succeeds, a considerable saving in the cost of materials for concrete construction would be realized.

Educational Notes

Women engineers elect—Four civils were among the 73 women engineers attending the second annual conference of the Society of Women Engineers held May 27 and 28 at Green Engineering Camp, Cooper Union, Ringwood, N. J.

Phyllis Evans, of Drexel Institute, presided as president over the business meeting at which the society's membership requirements were altered from student to graduate to qualify for full membership after April 1, 1952. Four years of engineering experience will be accepted in lieu of graduation from an accredited engineering college.

Mrs. Beatrice Hicks Clapp, vice president and chief engineer of Newark Boiler and Regulator Co., Bloomfield, N. J., was elected president for the coming year, and Miss Phyllis Evans is the new secretary. Miss Ruth Boelden, senior civil engineering student at Cooper Union, was convention chairman. Prof. Mary Blair, of Cooper Union was faculty adviser to the conference.

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VULCAN PILE EXTRACTORS

With Vulcan on the job, you've got all the extra pile pulling power you'll ever need in one dependable machine. All claims made for the efficiency, ruggedness and speed of this great pile extractor have been proved again and again through two decades of heavy duty service all over America.

The Vulcan is a simple machine with only one moving part. It's easy to operate and it can't get out of order. Designed specifically for pulling sheet steel, wood, concrete, H-beams and pipe pile. Vulcan comes in three sizes: No. 200 for smaller work, No. 400 for heavier jobs and No. 800 for pulling the longest, toughest piles. Write for complete details.

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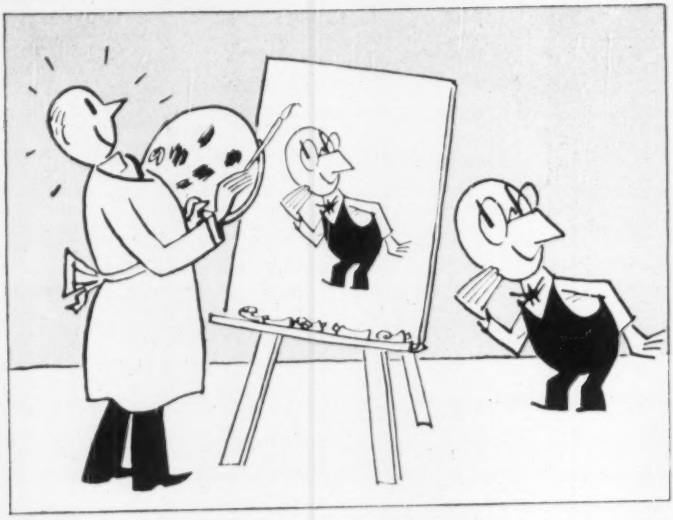


-POSITIVELY-it's the spittin' image"

HELIOS* dry developed, positive line prints on white backgrounds are exactly like your originals. You can count on their uniformity, crispness and clearness, whether the lines are black, blue or maroon.

K&E shoot for dependability in every item of their HELIOS line. They established a special plant to produce HELIOS materials exclusively—even the image-forming chemical components. So, HELIOS papers, cloths and films are the result of 83 years of K&E thoroughness and K&E zeal for perfection.

You can have HELIOS in opaque papers and opaque cloth for working prints, besides transparent papers and cloth, and clear and matte films, for intermediate originals (to use in place of originals).

You can print and develop HELIOS reproductions easily with any dry diazo ammonia process machine—even in a small office. No water, no wet mess, no plumbing—just a few seconds of a simple vapor treatment, and the job is done.

*Trade Mark

"PARAGON, eh . . . . .
has it a pedigree?"

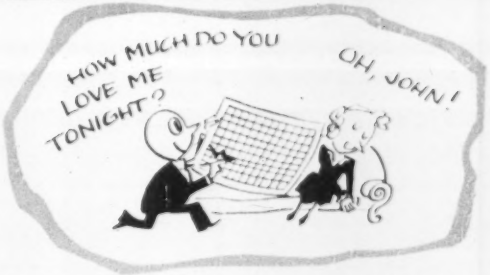
Yes, sir, there's a long pedigree to every K&E PARAGON* Surveying Instrument.

When you buy surveying instruments, you're not buying toothpicks or neckties. You're buying accuracy and endurance for a lifetime. And you're spending real money.

You want to know about the optics, the accuracy, the metals used, the wear on moving parts, the permanency of adjustment, the resistance to dust and moisture, the workmanship—and many other things.

These questions are all pretty well answered in Keuffel & Esser's 83-year-old reputation for making mighty good things for engineers and draftsmen. For 83 years, K&E equipment and materials have been partners in nearly every engineering project of any size anywhere. So, that's why I say: buy K&E PARAGON Surveying Instruments.

K&E make 300 different kinds of *Graph Sheets*



What do you want to graph—Grandma's health or variations in the price of spinach—polar coordinates or the surface tension of prunes?

K&E have a graph form for almost anything. Ask your K&E distributor or the factory for a catalog of their 300 forms, or if you need one they don't have, maybe they'll make up one for you, tailor-made.

They have graph sheets for plotting scientific data—square or rectangular section, logarithmic, reciprocal, electrical, and such. And forms for sketching and drawing, whether mechanical and architectural or for surveying and mapping. Also, business and financial graph forms—time series, data sheets and percentage. Their forms are on high quality tough drawing paper and on top quality tracing papers (including the famous ALBANENE*). Don't grope—graph . . . on a K&E form.

*Trade Mark ®

K&E
partners in creating
For 83 years K&E equipment and materials have been partners of the draftsman, engineer and scientist in shaping the modern world.

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EST. 1867
Drafting, Reproduction, Surveying Equipment and Materials. Slide Rules, Measuring Tapes
NEW YORK • HOBOKEN, N. J.
CHICAGO • ST. LOUIS • DETROIT • SAN FRANCISCO
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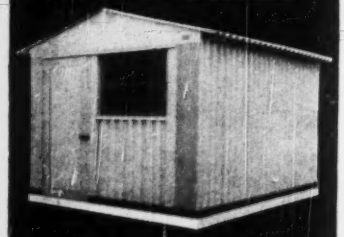
A 10' X 12'
LOW COST
STEEL BUILDING
OF
1,000 USES



Portable or Permanent
USF
HANDY-HUT
No Field Welding or Riveting
2 Men Can Erect
Expansible!

Just the ticket for a field office, tool house, storage house, pump house or any one of a thousand uses for contractors and engineers. The USF Handy-Hut is an all-steel, prefabricated formed steel frame that simply bolts together with box corrugated roofing and siding sheets that attach with clip-and-wedge fasteners. No special tools are needed, no field punching, welding or riveting is required. Meets fire and windage codes most localities and is suitable for either permanent or portable use. Multiple units may be erected to accommodate any size requirement without special engineering.

USF also produces larger steel buildings of the same general construction in 10' and 12' clear heights with 20' or 30' span widths for erection in length multiples of 13'-4" to any desired size.

WRITE FOR DATA

UNITED STEEL FABRICATORS, INC.
WOOSTER, OHIO

OBITUARY

Joseph Halveck, 66, hydraulic engineer for the Worthington Pump and Machinery Corp. of Harrison, N. J., died in Montclair, N. J., May 20.

John R. Stewart, 90, former town engineer of Renfrew, Ont., for 45 years, died recently.

W. H. Anderson, 61, Asheville, N. C., building contractor, died May 19. His construction firm built many of North Carolina's roads, including several sections of the Blue Ridge Parkway, and its activities extended into Virginia, Kentucky, West Virginia and other nearby states. He was president of the W. H. Anderson Construction Co., and the Asheville Contracting Co. He helped build the Murray Dam at Columbia, S. C. He also did considerable construction work for the Chesapeake and Ohio, the Norfolk and Western, and the Clinchfield Railroad companies in Virginia, West Virginia and Kentucky.

C. Donald MacDonald, 41, consulting engineer and formerly a professor of civil engineering at Mount Allison University, Sackville, N. B., died at Amherst, N. S., May 12.

Joseph P. Doulay, 61, general contractor of Buffalo, N. Y., died May 17. He had been a partner in the Border Building Co., since 1935. He was president of several construction companies, including the Allenhurst Gardens, Inc., D. & H. Development Co. and Allun Corp. He was a past president of the Buffalo Builders Exchange.

Cambridge Munro Trott, 62, president of Charleston Constructors, Inc., engineers and contractors, died May 18 at Charleston, S. C. Mr. Trott was graduated from Clemson College, S. C., with the degree of civil engineer. For two years before World War I he was with the United States district engineers office in Charleston. For a year he worked in the U. S. Department of Agriculture, doing drainage and survey work in North and South Carolina. During World War I he served as a captain in the 30th Engineers, 81st division, spending 11 months overseas. After the war he was associated with the Charleston Engineering Contracting Co., later becoming president of Charleston Constructors when it was organized.

James W. McGuire, 84, engineer and retired Coast and Geodetic Survey cartographer, died May 21 in Washington, D. C. He had been a resident of Washington for the last 40 years and retired about 15 years ago after more than 50 years with the government. He was recalled during World War II to do special mapping of the ocean floors. During World War I he was chief cartographer on a confidential advisory board.

John M. Basham, 61, retired civil engineer, died April 27 in Placerville, Calif.

John B. MacDonald, 66, civil engineer and president of the engineering firm of MacDonald & MacDonald, died at Vancouver, B. C., recently.

William W. Cruse, 74, retired engineer of Jefferson County, Ky., died in Middletown, Ky., May 2. He had been with the road department for 50 years.

John Marshall Dozier, Sr., 72, civil engineer and builder, died May 3 in Yorktown, Va. In earlier days, Mr. Dozier's Newport News Contracting and Engineering Co. built the first dirigible mooring masts for the Navy, plane hangars at the Panama Canal Zone, and the West Point Stadium.

A. J. Shellum, 47, an assistant civil engineer in the Seattle, Wash., city engineering department, died May 21. A 1925 graduate of Univ. of Washington, he was with city since 1926.

S. Howard Rippey, 74, retired consulting engineer, died May 18 at Philadelphia, Pa. He was associated with the late Coleman Sellers in developing the Niagara Falls hydro-electric plants. He later became a partner with Sellers in the firm of Sellers and Rippey.

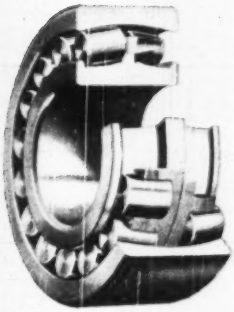
William P. Hammersley, formerly a member of the Massachusetts Highway Commission and town manager, Norwood, Mass., died at Harwichport, Mass., May 22. He served the commission from 1902 to 1915, and as town manager of Norwood, 1917 to 1925.

Sir Ralph Freeman, designer and builder of the 50,000-ton Harbor Arch Bridge, Sydney, Australia, completed in 1932, died in England recently.

James Berrall, 81, for 45 years a civil engineer in Washington, D. C., died there May 25. During World War I, Mr. Berrall was civil engineer and superintendent for the Geo. A. Fuller Co., in construction of the Marine barracks at Quantico, Va. Previously he was the chief engineer in planning the layout of the Vanderbilt estate near Asheville, N. C. Latterly he had been engineer for the Washington Cathedral, the Pan American Union and the Interior Department.

Marion type 43-M excavators swing smoothly into every job

on TORRINGTON SPHERICAL ROLLER BEARINGS



SPHERICAL ROLLER
TAPERED ROLLER
STRAIGHT ROLLER
NEEDLE
BALL
NEEDLE ROLLERS

The Marion Type 43-M excavator is designed for all-purpose work—as a one cubic-yard shovel, clamshell, dragline, backhoe, crane or pile driver. It's also designed to swing easily under load, with Torrington Spherical Roller Bearings on the center journal.

These heavy-duty bearings provide free-rolling self-alignment under shaft deflection. Uniform load distribution is maintained constantly, assuring long service life with minimum maintenance.

You can build extra performance and stamina into your equipment by specifying Torrington Spherical Roller Bearings. Let our engineers help you work out the details of your applications.

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South Bend 21, Ind. • Torrington, Conn.
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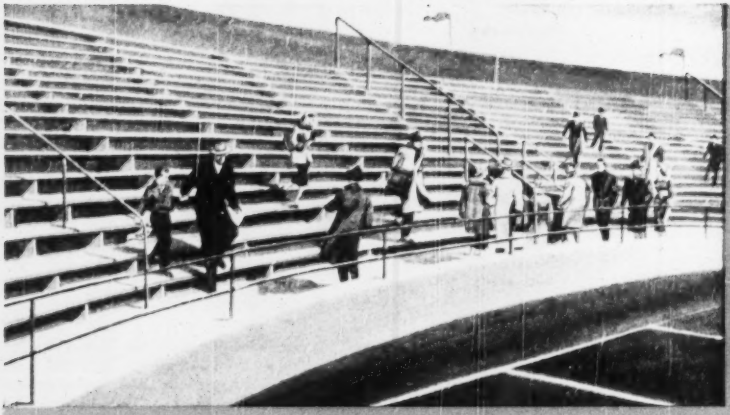
TORRINGTON *SPHERICAL ROLLER* **BEARINGS**



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specify

penta-
chlorophenol

FOR STADIUM SEATS THAT LAST LONGER
build with clean PENTA-PROTECTED wood

Stadium seats, which are especially subject to decay through constant exposure, can now be protected.

At small extra cost, stadium seats will last longer when built of PENTA-treated wood. PENTAchlorophenol—the modern wood preservative—is clean, does not leach and retains its chemical structure through the years.

For grandstands, loading docks, bridges—and any wood structure, build with PENTA-PROTECTED wood—the wood that's protected against decay and termites. For further information write Dow, Dept. PE-20-A.

THE CLEAN WOOD PRESERVATIVE!

What PENTA means to the utilities

Light, power and telephone companies are switching to PENTA. They've found that line crews prefer clean poles treated with PENTA. Long lasting PENTA protection means longer pole life and reduced maintenance costs.

THE DOW CHEMICAL COMPANY
MIDLAND, MICHIGAN

DOW
penta-
chlorophenol

CONSTRUCTION REPORTS

Bids Asked—Low Bidders—Contracts Awarded

Compiled by Business News Department—Engineering News Record, 330 W. 42nd St., New York 18, N. Y.
ELSIE EAVES, Manager J. A. MAHONEY, Reports M. R. ROESSLER, Statistics

WATER SUPPLY

BIDS ASKED

Tex. Burnet

Tex. Carrizo Springs

Tex. Houston

Tex. Pasadena

LOW BIDDERS

Pa. Phila.

$216,500

CONTRACTS AWARDED

Calif. San Bruno

$31,944

Okla. Idabel

$184,260

Tex. Houston

Water Const. Assocs. $65,000

SEWERS, WASTE DISPOSAL

BIDS ASKED

Tex. Carrizo Springs

Tex. Houston

Tex. Houston

Tex. Pasadena

LOW BIDDERS

Calif. Lakewood

$347,347

CONTRACTS AWARDED

N. Y. Freeport

$24,995

Okla. Idabel

$51,304

$108,446

BRIDGES

BIDS ASKED

Virginia

Norfolk Co.

New Jersey

Gloucester County and Burlington County

New Jersey

Hudson Co.

LOW BIDDERS

▲ New Jersey

$57,618

$53,088

$129,904

$112,402

CONTRACTS AWARDED

▲ N. Y. Atlantic Beach

$2,310,696

Wash. Seattle

$62,241

$206,422

$5,145,306

STREETS AND ROADS

BIDS ASKED

Ore. Salem

Tex. Houston

Tex. Houston

Tex. Pasadena

LOW BIDDERS

† Fla. Key West

Calif. Edwards A. F. B.

$595,620

Pa. Phila.

$50,387

77,207

$51,383

$57,175

$94,172

Tex. Wichita Falls

$141,341

PROJECTS COVERED

Projects—By Size

Classes of Construction

Stages Reported

Symbols and Abbreviations Include

† Revised

▲ Revised or Supplementary Item

BA Bids Asked

ENR Engineering News-Record

CD Engineering News-Record Construction Daily

Any Good Contractor CAN DRIVE THIS PILING

Are you passing up profit opportunities in foundation work? Many general contractors have found they can handle these jobs profitably and efficiently with the aid of Armco Pipe. They get these important advantages:

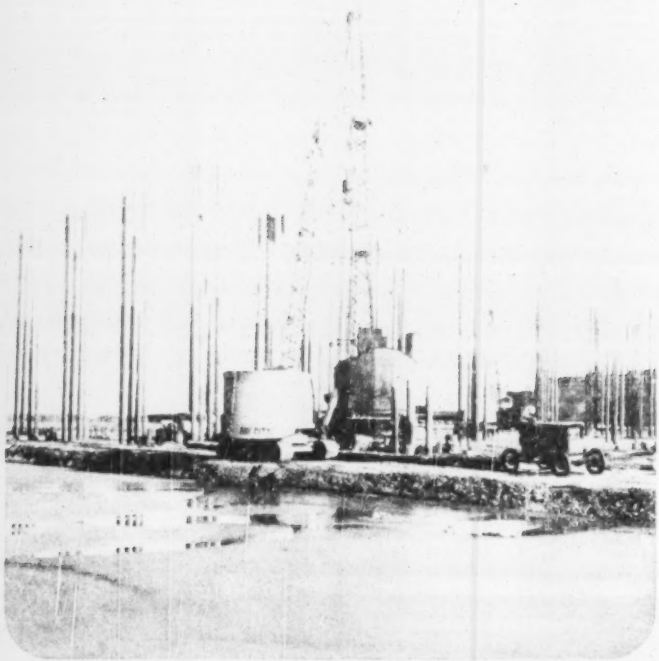
1. NO SPECIAL DRIVING EQUIPMENT is required with either light or heavy Armco Pipe.
2. NO TOP REINFORCEMENT needed for driving pipe as light as ⅛-inch wall, 14-inch diameter.
3. MILL ATTACHED PLATE ENDS, cone points or cutting shoes save time and trouble in the field.
4. CUTOFFS CAN BE SALVAGED economically because Armco Pipe is uniform in diameter.
5. SPECIFIED LENGTHS (not random) help eliminate extra handling and field splicing.
6. DRY PILES QUICKLY INSPECTED because Armco Pipe is straight driving and watertight.

It will pay you to get the complete story on Armco Foundation Pipe today. Just write to: Armco Drainage & Metal Products, Inc., Welded Pipe Sales Division, 5040 Curtis Street, Middletown, Ohio. Subsidiary of Armco Steel Corporation.

Export: The Armco International Corporation

ARMCO FOUNDATION PIPE

ARMCO



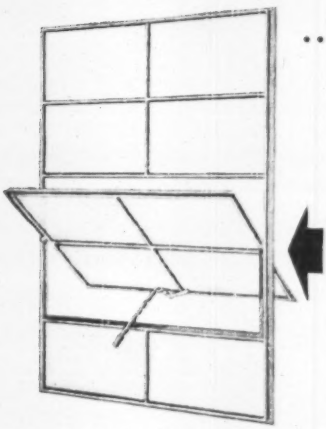
CONTRACTS AWARDED

EARTHWORK, WATERWAYS

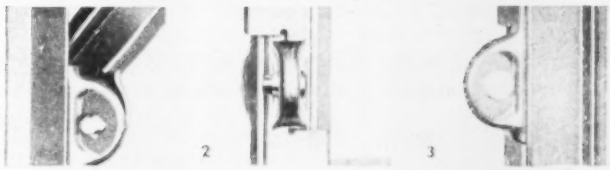
Tips on cutting window costs

If You Want To Cut Maintenance Costs

...look for this Window Feature



New Fenestra Pivoted Window



THE NEW STREAMLINED
INTEGRAL VENTILATOR BUTT

One of 7 Features of Fenestra Superiority

Above, you see the new Fenestra® Pivoted Steel Window and 4 views of the exclusive feature that slashes window maintenance . . . the new, streamlined *integral* butt which keeps vents fitting perfectly for complete weather-tightness. (1) Frame side (2) Head-on, inside view (3) Window side (4) Overlapping weathering sections. The butt has no protruding parts open to damage. Cup shape and drawn ribs give it special strength.

Fenestra Pivoted Windows are widely used for extra daylight, fresh air and see-through vision.

With slender lines and extra glass area, all Fenestra Industrial Steel Windows bring in extra daylight . . . reduce accident-tempting shadows. They bring in cool, clean fresh air, no matter what the weather—protecting ventilators guard the openings. They're good looking and rugged, warpproof and firesafe. They can be easily combined vertically or horizontally to form whole walls of windows.

Fenestra Windows cost less in three important ways: *Low first cost:* Standardization of types and sizes permits efficient volume production. *Low installation cost:* Modular sizes provide co-ordination of windows with wall materials. *Low maintenance cost:* Precision fabrication of strong, high-quality materials.

For plants, offices, labs, warehouses, commercial buildings and many others, Fenestra Industrial Steel Windows are your best bet for high quality at remarkably low cost.

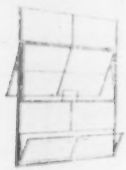
Mail the coupon for types and sizes. Or call your Fenestra Salesman (listed in your Yellow Telephone Directory) . . . Representative of America's oldest and largest Steel Window Manufacturer.

7 SAVINGS WITH NEW FENESTRA WINDOWS

1. Butts integral with jamb weathering bars—stronger, fewer parts, lower maintenance.
2. Precision machining of window bars—windows and vents of exact, uniform sizes.
3. Automatic assembly of ventilators—vents fit properly and operate easily.
4. Extended jamb bars—vents always align perfectly.
5. Strong, tight-weathering sections—continuous double contact all around vent opening.
6. Rigid, interlocking mullion joints—rugged construction for low maintenance.
7. Strong hardware attachment—vents safe from breakage, offers safer locking.

COMMERCIAL PROJECTED WINDOW

Projected ventilators are mechanically operated by worm gear operators. Operators are concealed within the frame. Operating mechanism is protected from the weather. Vents open outward. Shutters may be added.



Fenestra

WINDOWS • DOORS • PANELS

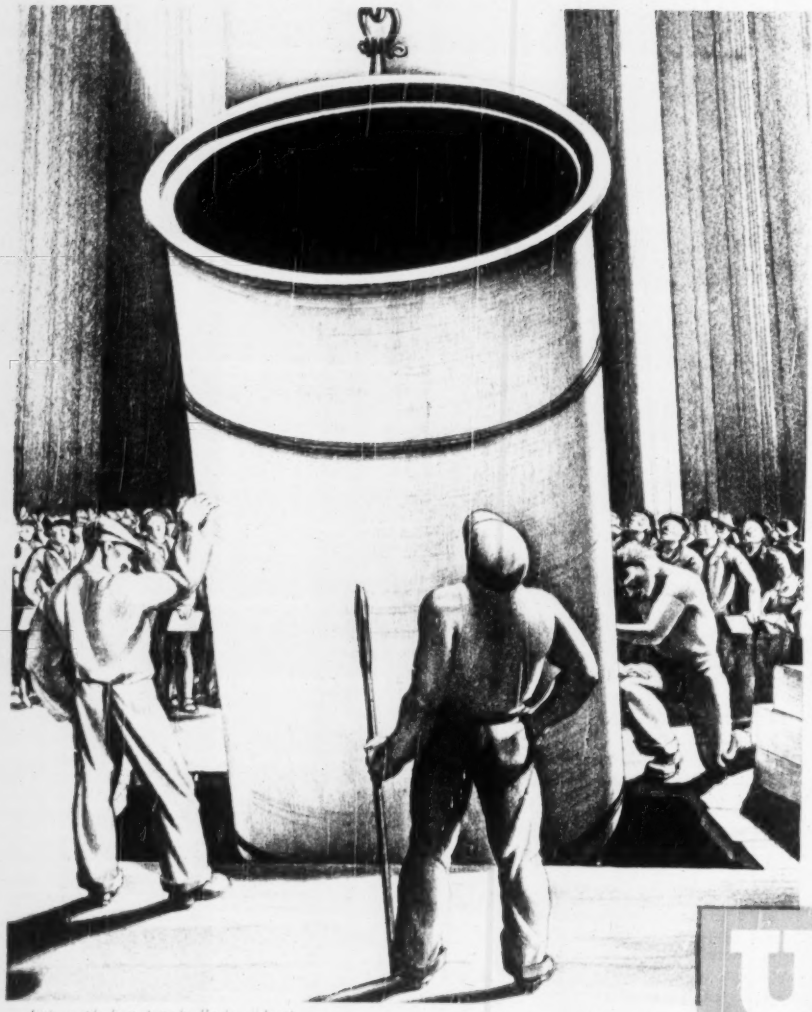
DETROIT STEEL PRODUCTS CO.
Dept. ER-6, 2727 E. Grand Blvd.
Detroit 11, Michigan

Please send me information on types and sizes of new Fenestra Industrial Steel Windows.

Name

Company

Address



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"Meet the customers' needs" has been our watchword for more than fifty years. Whether it's pipe seven feet, or a few inches, in diameter—or a complicated fitting—or a special casting—we have the equipment and the technical skills to meet almost any need for cast iron pressure pipe and fittings. Taking advantage of process developments and utilizing scientific methods to control quality, our plants are regularly manufacturing products that adequately meet our customers' exacting requirements. **United States Pipe and Foundry Company, General Offices: Burlington, N. J. Plants and Sales Offices Throughout U. S. A.**

Continued from page 70

LOW BIDDERS

+ New Jersey

+ Texas

CONTRACTS AWARDED

▲† California

† New York

Tex. Houston

AIRPORTS

BIDS ASKED

+ Fla. Tampa

LOW BIDDERS

+ O. Cleveland

FOREIGN

New South Wales, Sydney

PUBLIC BUILDINGS

BIDS ASKED

▲ Calif. Long Beach

+ Wash. Richland

▲ Calif. Los Angeles

+ N. J. North Arlington

▲ Pa. Somerset

▲ N. C. Raleigh

B. C. Port Alberni

LOW BIDDERS

Mass. Braintree

▲ N. Y. New York

CONTRACTS AWARDED

Calif. Riverside

▲ N. Y. New York

▲ Pa. Philadelphia

† Tenn. Oak Ridge

W. Va. Parkersburg

▲ B. C. Terrace

COMMERCIAL BUILDINGS

BIDS ASKED

Mass. Pittsfield

Que. Montreal

▲ Wash. Yakima

Wis. Milwaukee

SOON LETS CONTRACT

Calif. Pasadena

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Mass. Millbury

N. J. Hasbrouck Heights

N. Y. Trenton

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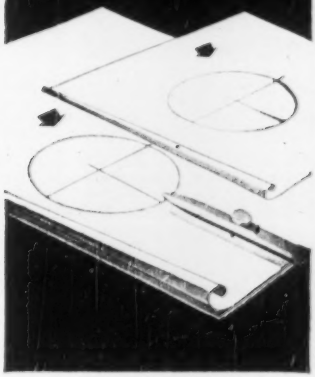

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Imperial takes erasures readily, without damage. It gives sharp contrasting prints of even the finest lines. Drawings made on Imperial over fifty years ago are still as good as ever, neither brittle nor opaque.

If you like a duller surface, for clear, hard pencil lines, try Imperial Pencil Tracing Cloth. It is good for ink as well.

IMPERIAL TRACING CLOTH

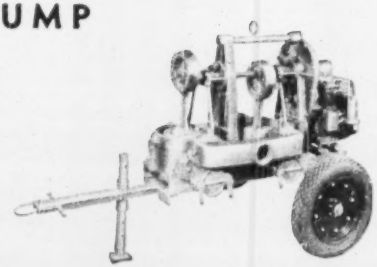
SOLD BY LEADING STATIONERY AND DRAWING MATERIAL DEALERS EVERYWHERE

NOVO QUALITY EQUIPMENT FOR FIFTY-NINE YEARS

A NEW PUMP

- DOUBLE DIAPHRAGM
- DOUBLE CAPACITY
- DOUBLE DUTY

Handles twice the amount of muddy, or sand and debris laden water as does Novo's well known single diaphragm model. Write or wire for specifications on this new pump.



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1½" to 6"
3,000 to 90,000 G.P.H.

PRESSURE PUMPS
Simplex or Duplex
200 P.S.I., 15 to 94 G.P.M.

PAVEMENT BREAKERS
3,000 lb. Drop Hammer
Mounts on 1½ Ton Truck

DIAPHRAGM PUMPS
3" or 4", Single or Double
3,000 to 10,000 G.P.H.

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Single or Double Drum
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ENGINES
Air-cooled, 4 to 8 H.P.
Water-cooled, 10 to 32 H.P.

NOVO ENGINE COMPANY, LANSING, MICH.

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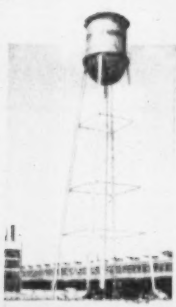

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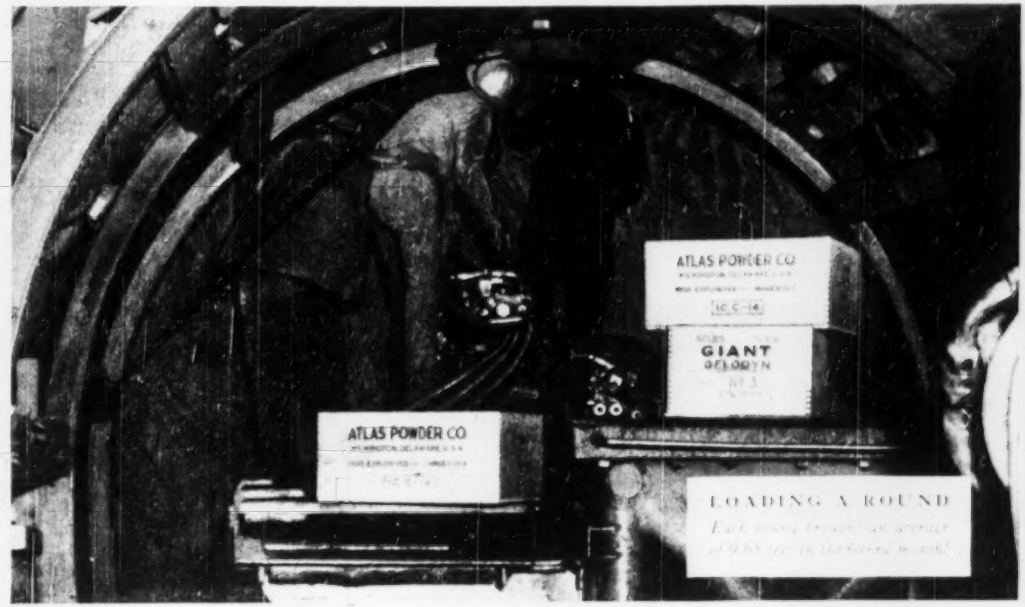
MOTT CORE DRILLING CO.
HUNTINGTON, W. VA.

They Broke Tunnel-Driving Records on the Owens River Gorge Project!



...and Atlas explosives were a part of the record-breaking team!

Water for Los Angeles power in a hurry! That's the order of every day for the tunnel stiffs of Owens Tunnel Contractors. Blasting through rock for the Los Angeles Department of Water Supply and Power, they've broken record after record in their race against time.

78.77 feet average drive per day! 101 feet in one day! 550.81 cubic yards per day, average! 2,442 feet in a record-breaking 31-day period! That's tunnel-driving history!

We are proud to have supplied explosives to the men whose skill and hard work made such records possible!

On your next blasting job, call on Atlas, originator of the Rocksaver® millisecond delay blasting system and many other improvements in explosives and blasting methods. Atlas supplies the *right* explosives—plus service—for tunnel-driving, excavating, road-building, pipeline ditching.

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"Everything for Blasting"

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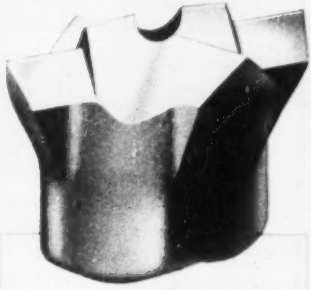
Gives lowest cost per foot of hole when full increment of drill steel can be drilled and when control and reconditioning of bits are correct.

2. CARBIDE INSERT

For drilling extremely hard and abrasive ground, small holes, extra deep holes. Drillers spend more time drilling—less time changing bits.



3. ONE-USE "SPIRALOCK"

To use where reconditioning is impractical or undesirable. Lowest unit cost. "Spiralock" union holds bit on dependably—permits easy removal.

Only TIMKEN® offers all 3 rock bit types...and a complete Rock Bit Engineering Service!

THERE'S one best bit for every drilling job. And Timken can give it to you. Only Timken makes *all three* rock bit types—multi-use, carbide insert, and one-use. And the Timken Rock Bit Engineering Service helps you select the type, size, and shape to give the drilling performance your job demands—whether it's lowest bit cost, lowest cost per foot of hole, greatest possible drilling speed, or other desired advantage.

FREE BOOKLET: Timken's newest rock bit booklet gives full information on all three types of Timken removable rock bits. Shows full line of bits in actual-size photographs, with detailed descriptions. Write on your company letterhead to The Timken Roller Bearing Company, Rock Bit Division, Canton 6, Ohio. Cable address: "TIMROSCO".

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. . . for <u>every</u> job

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SOON LETS CONTRACT

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CONTRACTS AWARDED

LOW PRICED, TRAILER-TYPE DIGGER HYDRAULICALLY OPERATED

You Need a

HOPTO

DIGGER – SHOVEL

ATTACHES OR DETACHES IN LESS THAN A MINUTE TO POWER TAKE-OFF OF TRACTOR, JEEP OR TRUCK

HOPTO SHOVEL OR BACK-HOE HAS MANY USES: Drainage • Sewers • Septic Tanks • Man Holes • Water Systems • Utility Pipe and Conduit Laying • Footings • Excavations • Material Handling • Farm Derrick.

Compare These Money-Making Features

- ★ Digs over 9' deep and still loads into trucks.
- ★ Hydraulic Cylinders are chrome plated to withstand weather.
- ★ Independent, double-acting hydraulic cylinders and control valves for dipper stick and boom.
- ★ Swing is controlled by two single-acting cylinders.
- ★ Highly transportable from job to job without any special permit.

Full 180° swing, finger-tip operation, *low first cost*, minimum maintenance, and 15-30 yard hourly capacity adapts HOPTO to a wide variety of *profitable work*. And HOPTO needs no counter weights . . . NO swing clearance! Three types of buckets, 14" to 24" widths, are available for HOPTO—enclosed, skeleton and shovel bucket. Reversible teeth are of cast alloyed steel, heat treated for longer life.

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The Stang System has proved its efficiency and economy on both large and small jobs all over the United States. Stang engineering and supervision in planning, installation and operation insures a DRY JOB at all times.

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Scoring on three important points; —scientific design, rugged construction and proper installation, Layne Well Water Systems are generously qualified for the heaviest production jobs on record. Furthermore, once installed, these systems keep right on providing good service for years and years. Records show that upkeep cost, in the majority of installations, is almost non-existent. All installations are exclusively by Layne Associated Companies whose engineers and field crews are widely experienced and thoroughly qualified. All contracts cover the job complete, including the final testing of the unit to assure Layne engineers and the buyer that the System is satisfactory in every way. For further information, catalogs, folders, bulletins etc., address

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VERTICAL TURBINE PUMPS

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PROPOSED PROJECTS

UNCLASSIFIED

WATER SUPPLY

SEWERS, WASTE DISPOSAL

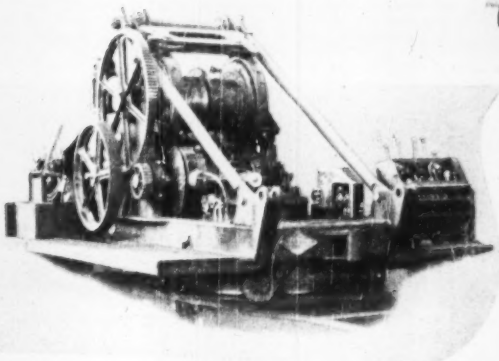
BRIDGES

STREETS AND ROADS

(continued on page 81)

Wheel Mounting now adds EXTRA CAPACITY and GREATER MOBILITY to LIMA

Types 34 and 604



LIMA Type 604-M showing main machinery in position during assembly. Note hook roller construction and sturdy machinery base.

Illustrated above is the LIMA "Paymaster" (Type 34-M) mounted on wheels to provide the advantages of better mobility and extra capacity where ground conditions permit its application. Two sizes are now available with wheel mounting—the "Paymaster" and the LIMA Type 604. Wheel mounted "Paymaster" has shovel capacities of ¾ or 1 yd., and crane capacity of 20 tons. Type 604-M is a 35 ton crane. (Capacities rated with outriggers supported). Type 34-M is readily converted to crane, shovel, dragline or pull shovel. In these units one engine powers all operations, including travel, and one operator controls them all from his cab. LIMA wheel mounted machines are ideal for many material handling operations requiring constant movement around the job. They will save travel time and reduce cost of moving machine between scattered job sites—often justifying the use of equipment on even the smallest operation.

Truck-Mounted "Paymaster" also available

You can now also get the LIMA "Paymaster" (Type 34-T) in a truck mounted unit with separate engine for travelling between jobs at speeds up to 35 MPH. Crawler-mounted LIMA machines are available in Shovel capacities from ¾ to 6 yds., Cranes to 110 tons and Draglines variable.

It will pay you to consult your nearest LIMA Sales Office or Representative before you buy your next shovel, crane or dragline. Offices in principal cities of the world

Lima Shovel and Crane Division

LIMA, OHIO

OTHER DIVISIONS: *Lima Locomotive Works Division; Niles Tool Works Co., Hooven, Owens, Rentschler Co.*

LIMA HAMILTON CORPORATION

NEEDS NO MUD PROTECTION . . .

GARDNER-DENVER VP4 SUMP PUMP

Mud can't hurt the Gardner-Denver VP4 Pneumatic Sump Pump. Designed on a new principle of TOP-SUCTION—the VP4 can't "dig in"—won't bury itself in a muddy sump—won't block inlet flow.

Top-suction also eliminates one of the most common causes of pump failure—breaking of the pump shaft seal because of water pressure. *Top-suction* keeps all dirt and water away from the oil seal, bearings and air motor—actually pulls lubricant into the seal.

Write for complete information about this *better* sump pump.

GARDNER-DENVER

Since 1859

Gardner-Denver Company, Quincy, Illinois

In Canada:
Gardner-Denver Company (Canada) Ltd., Toronto, Ontario

(Continued from page 78)

$1,850,000. J. T. Vinson, Jr., Wash. Eng. Dir., c/o owner. Manuf. & Service Bldgs. & sewers, also eng., CD 12/14/49.

▲ Tex. Edinburg—Hidalgo Co., Edinburg, defeated bonds through county relief, $2,500,000. Project abandoned. CD 5/18.

Tex. San Antonio—Fred W. Davis, c/o Gus D. French, 1210 Main St., Dallas, asphalt street paving, concrete curbs and gutters, Brook Haven subdivision, $100,000. J. W. Beretta, Engineers, 902 Travis Bldg., consult. engrs.

Wash. Port Angeles—City, City Hall, $300,000 bond election July 11; 24 ft. concrete, with slope protection on Ennis Creek, Royal Ave. Bridge, superseding Caroline Pedestrian to 32 Cherry St. Bridge; arch on 2 to Marine Dr., Ennis Creek to Tumwater; City Marine Dr. & Tumwater to Race Sts., $500,000. Hp Arkens, City engr., CD 4/13.

Wash. Seattle—City, County, City Bldg., Zone 4, grading, paving, storm sewers, Aves. N. E. 4th, 5th and 7th Sts., $848,764. P. W. Fiske, City engr.

EARTHWORK, WATERWAYS

Pennsylvania—General State Auth., 18 and Herr Sts., Harrisburg, construct and add Building across Court and construct public facilities, Bathhouse, fireplaces and similar buildings, recreational facilities at Beltzville Park, Lehigh Co., $140,000. Department Supply and Property, Harrisburg, Pa., Chickies Creek at White Oak Run, Elevation of Penna. Turnpike, Lancaster Co., $140,000. A. F. Jones, Jr., Turnpike Engr., Harrisburg.

Alaska—Ketchikan—City, City Hall, retaining wall, $200,000. L. D. Hubbard, City engr.

AIRPORTS

▲ N. J. Newark—RUNWAY, Port of New York Auth., 111 8th Ave., New York, 11, N. Y., grading, drainage & 200 ft. runway at Newark Airport, $1,571,930. CD 4/27/49.

† Wis. Milwaukee—HANGAR, National Guard Bureau, Camp Douglas, two-wing 1 story 14,000 sq. ft. hangar, tank farm, utilities, Bernard J. Mitchell, Exec. in Lieut., $350,000. Dahm, Brown & Arnold, Inc., N. Milwaukee, Wis., Zone 2, archts. and engrs. CD 11/14/49.

LATIN AMERICA

Mexico—National Railways of Mexico, Boulevard J. Mata 1, Mexico, D. F., 2 ft. 6 in. gage, 3 ft. 6 in. gage, 4 ft. 8½ in. gage, 1 line in American part of Tamaulipas, at Vera Cruz, Oaxaca, Chiapas, $1,380,000.

Mexico, Guadalajara—Municipal Govt., Palacio Municipal, Guadalajara, Jal., 2 piers, interurban bus, and truck terminal, $300,000.

PUBLIC BUILDINGS

Calif., Duarte—SCHOOL, Duarte School Dist., $1,87[illegible] Lemon Ave., North East School, $368,973. [illegible] Lemon Ave., classroom addition and cafeteria, $448,514.

Calif., Orange—[illegible] Orange, $730,000 schools, [illegible]

Calif., Santa Paula—SCHOOL (Addition), Santa Paula Union High School Dist., Santa Paula, voted $500,000 [illegible] Hall & Pray, CD 4/24.

Conn., Meriden—[illegible] No. 1 Cir., Meriden Housing Auth., [illegible] Lane Terrace, plans by Dodd & MacKay, 30 Colony St., [illegible] Lane Terrace, [illegible] Lane Terrace, New Britain, [illegible] family units, $650,000.

Conn., North Grosvenor Dale—[illegible] Bd. Sel[illegible] Town Hall, plans by Wadsworth & Ames, 16 Pratt St., Hartford, [illegible] brick steel [illegible], $425,000.

Del., Wilmington—[illegible] Ed., Lea. 11 and [illegible] Ave., Lewis by George J. Pyle & Albert [illegible], 11 classrooms, cafeteria, [illegible] 13, $850,000.

La., Tallulah—[illegible] Madison Parish, [illegible] voted $600,000. CD 4/18.

▲ Mass., Holden—[illegible] Holden, [illegible] by Perry, Dean, Stahl & Rogers, Boston, $1,500,000.

Mass., Hudson—[illegible] Hudson, [illegible] by Perry, Dean, Stahl & Rogers, Boston, $750,000.

N. J., Keyport—[illegible] Keyport, $400,000.

N. J., Newark—[illegible] Newark, $750,000.

N. J., Summit—[illegible] Summit, $800,000.

▲ N. Y., Huntington—[illegible] Huntington, Free School Dist. No. 3, [illegible] Park Ave., $1,100,000.

O., Columbus—[illegible] Columbus, [illegible] Ave., [illegible] Columbus, [illegible] by Karl A. [illegible], 4 cl...

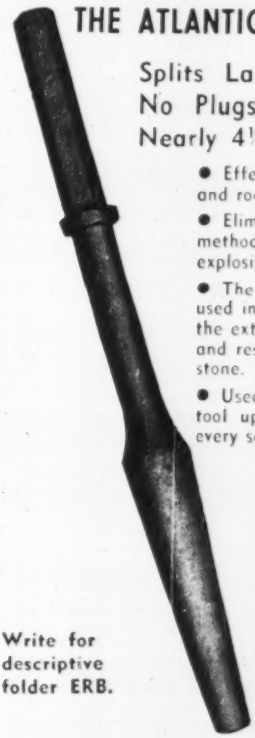
ATLANTIC Pneumatic TOOLS

Use with your standard power pavement equipment . . . .

THE ATLANTIC PNEUMATIC ROCK BREAKER

Splits Large Rocks and Boulders quickly
No Plugs and Feathers — No Explosives
Nearly 4½ times faster

- Effective quick action in removing stones, boulders and rocks from excavations and ditches.
- Eliminates the slow and costly plug and feather method, and the risky and troublesome use of explosives.
- The specially heat-treated Atlantic Tool Steel used in the Atlantic Pneumatic Rock Breaker gives it the extreme toughness to withstand the severest usage and resist breakage regardless of the hardness of the stone.
- Used with standard power pavement breakers. No tool upkeep. Tougher than any stone. A size for every service.



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Non-tempering tool steels for greater safety and speed.

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155 EAST 44th STREET, NEW YORK

New, Improved Hammer and Tampers

EASIER-TO OPERATE, SPEED WORK, LAST LONGER

MASTER'S electric "power blow" hammer is a really tough tool that drills into concrete, chips steel and cast iron, drives stakes, caulks ships—and does other heavy work formerly handled only by "pneumatics." MASTER'S gasoline or electric tampers are light in weight yet deliver powerful blows from 6150 to 8650 per minute. No vibration in the handle to tire the operator. Wide range of attachments for both hammer and tampers. Write for catalog No. 688 and No. 699.

Gasoline Engine Backfill Tamper

Hot Tamper Plate used with backfill Tamper

Clay and Shale Spade

Asphalt Cutter

Master Red Seal Power Blow Electric Hammer and Spade

MASTER VIBRATOR COMPANY

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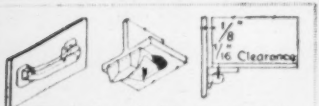

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Saxe System Welded Connection Units for welded assembly

Saxe units place in position and securely hold together structural parts to be welded.

As used in many welded structures they eliminate all hole punching, producing an economical, rigid, safe and quickly erected structural frame.

Write for 58 pg. Manual containing full engineering design information for welded structures.

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VACUUM CONCRETE

Most economical to use for
PRECAST WALLS, FLOORS, ROOFS, BEAMS and COLUMNS—
IT MULTIPLIES THE SPEED

Vacuum Lined Forms can be
RE-USED AS MANY AS 8 TIMES IN ONE DAY
VACUUM HANDLING EQUIPMENT
Strips castings from molds and handles them without breakage

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COMMERCIAL BUILDINGS

Installing Bethlehem Safety-Beam Guard Rail and Bethlehem Steel Posts on Route 116, near Hinesburg, Vermont. Guard Rail Erector: Costantino Brothers, Inc., Providence, R. I.

Sharp Turns? Embankments? Use Safety-Beam Guard Rail

At sharp turns, embankments, bridge approaches—in fact, at any dangerous location along a highway—provide the extra protection afforded by Bethlehem Safety-Beam Guard Rail.

Safety-Beam Guard Rail is ideal for use at danger points because of its strength and ability to absorb impact. The rail consists of heavy sections of steel plates, bolted together to form a continuous, impact-absorbing beam. When a runaway vehicle strikes Safety-Beam, impact is absorbed not by one post but by several, making it next to impossible to crash through the rail. In practically every case, the vehicle is directed parallel to the rail.

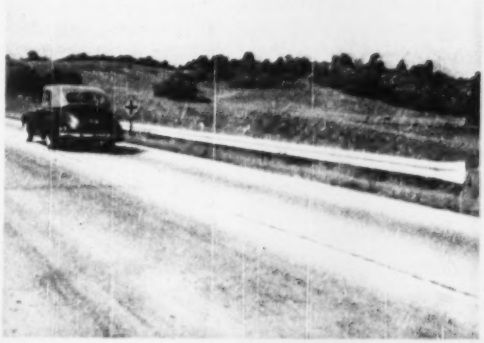
Safety-Beam Guard Rail is easily visible, both day and night. It can be installed quickly, even by unskilled labor, for it fastens to the post with one bolt. Can be used with either steel or wood posts. No end anchor rods, special tools or complicated adjustments are required. Safety-Beam is regularly furnished in 12 ft. 6 in. lengths, but can also be obtained in longer lengths.

Our Folder 545 gives detailed information about Safety-Beam Guard Rail. Ask the nearest Bethlehem sales office for a copy, or write to us at Bethlehem, Pa.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

Safety-Beam Guard Rail protects cars from damage on this unique course for new drivers, which is operated at Harrisburg, Pa., by Pennsylvania State Police. Guard Rail Erector: L. S. Lee & Son, Harrisburg.



Safety-Beam is easily visible at all hours, even despite heavy weed growth. This typical installation is located on Route 8, near Canton, Ohio. Contractor: Lewis and Fisinger Co., Ann Arbor, Michigan.

STEEL FOR HIGHWAYS

Dowel Units • Reinforcing Bars • Bar Mats • Guard Rail
Guard Rail Posts • Wire Rope and Strand • Pipe
Hollow Drill Steel • Spikes • Bolts and Nuts
Tie-Rods • Timber Bridge Hardware
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BETHLEHEM STEEL

Whatever your construction job asks of a truck . . .

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Heavy-duty engineering for long truck life on tough truck jobs is yours now in every single new International Truck from 4,200 to 90,000 pounds GVW.

That's the same extra value engineering that has kept Internationals first in the sale of heavy-duty trucks for 18 straight years.

America's most cost-conscious, profit-minded truck users have preferred Internationals year after year for only one reason: heavy-duty engineering means that International Truck performance is longer life performance, lower operating and maintenance cost performance.

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Model for model, here is "the roomiest cab on the road." It gives you new comfort in easy-riding cushions, adjustable seats, controlled ventilation. It gives you full front visibility through a one-piece, scientifically curved Sweepsight windshield.

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You'll get an all-new truck proved under actual operating conditions

"Proved under actual operating conditions" takes in years of time, millions of dollars, countless miles. But these new Internationals took in all those and then some—to give you proved-in-advance performance.

No matter what kinds of roads or loads, climate or conditions your trucks must meet, there's a new International that has been *proved* right for your requirements.

Find out all about that truck from your nearest International Truck Dealer or Branch, soon.

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Refrigerators and Freezers

Tune in James Melton and "Harvest of Stars"
NBC, Sunday afternoons

ALL NEW, ALL PROVED

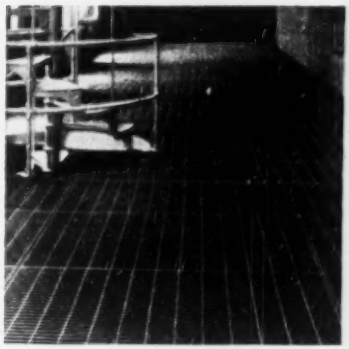
INTERNATIONAL TRUCKS

INTERNATIONAL HARVESTER COMPANY CHICAGO

Continued from page 82

When you specify

Hendrick Mitco Open Steel Flooring



you secure these outstanding advantages: 90% open area for light and ventilation . . . square-edge, uniformly spaced steel bars that provide a non-slipping, level walking surface . . . pressure-formed Mitco construction that obviates weaknesses of bolts, rivets and angle irons—eliminates dirt-catching and light-obstructing projections . . . ample strength to support heavy loads without any lateral deflection of flooring. Write for Hendrick Mitco Products catalogue.

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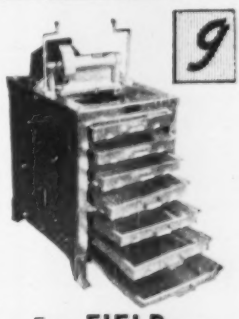
KONIK metal has the strength and tough endurance that culvert use demands. It resists rust and corrosion and the constant pressures culverts have to take. KONIK is an open hearth metal that contains copper, nickel, chromium and other elements—and it is heavily zinc coated for still greater protection. For culverts that will last longer get KONIK metal. Ask your culvert distributor or write Continental at Kokomo, Indiana.

ASK TO SEE THE KONIK CULVERT METAL WARRANTY

Your Continental Culvert sheet distributor will be glad to show you the Certified Analysis that assures longer culvert life with KONIK metal.

CONTINENTAL STEEL CORPORATION
FENCE • BARBED WIRE • POSTS • NAILS • ETC.



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TESTING SCREEN

● This machine is designed for the efficient sizing of test samples. It takes samples up to one cubic foot and makes from two to seven separations simultaneously, in five minutes or less —For fast, accurate sizing of coarse or fines from 4" to 200 mesh specify a Gilson Testing screen.

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Nearby Stocks Include:

REINFORCING BARS and accessories
STRUCTURALS—channels, angles, beams, etc.
PLATES—sheared and U M., Inland 4-Way Floor Plate
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Wherever there's ground water, only "Complete" gives *Complete* assurance of *Complete* elimination of the hazard. These patented fluted tube wellpoints remove more water faster . . . more easily, more efficiently, most economically!

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UNCLASSIFIED

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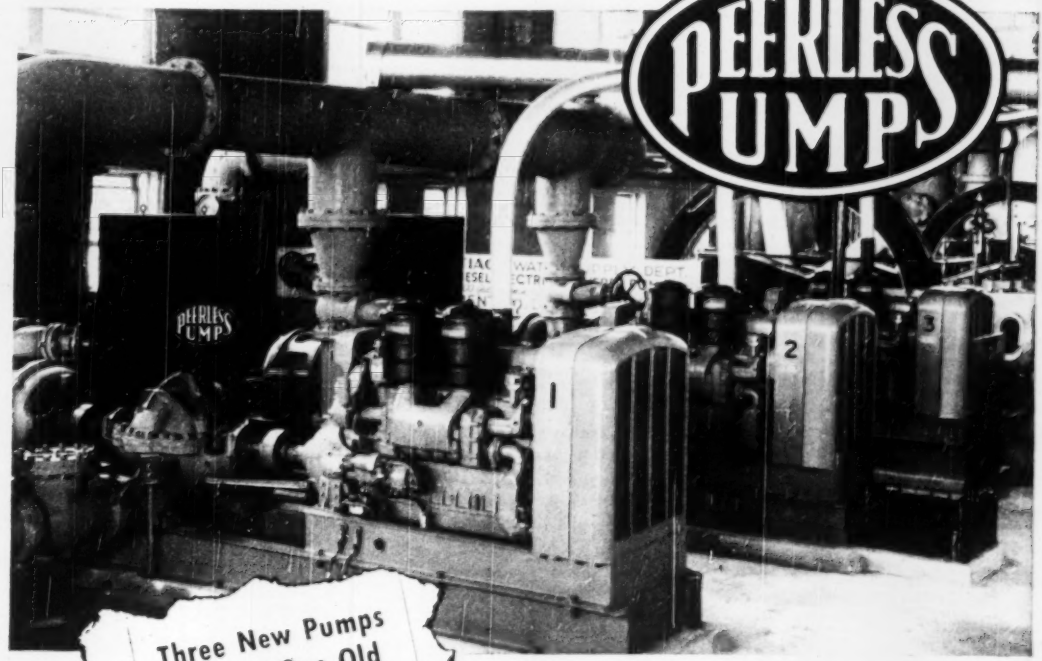
For Contracts Reports Sought Section see page 971

DIESEL POWERED MUNICIPAL PUMPING STATION REPORTS PUMPING COSTS CUT 25%



Three New Pumps Replace One Old

The age of the damaged pump and high cost of repairs militated against any attempts to put it back in operation, and thus the decision was made to replace it with the three horizontal centrifugal pumps. The pumps selected were Peerless Pumps, characterized by the occurrence of normal operation in the 87% efficiency range. Normal operation, dictated by the top level of elevated storage is at 67 pounds pressure and 2,500 gpm.

Reprinted from American City Magazine, February, 1950

87% EFFICIENCY RANGE CHARACTERIZES PEERLESS PUMP INSTALLATION FOR EASTERN CITY

Municipalities count high efficiencies over extended pumping periods as only one reason for their acceptance of Peerless centrifugal pumps. Dependability, ease of maintenance, widest capacity range, quality construction set the Peerless standard for pump performance and operating economy. Look to Peerless for continued leadership in pumping water at measurable savings. Write today for Bulletin B-1500 describing and illustrating Peerless Type-A horizontal pumps, shown installed in the photo above.

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FOOD MACHINERY AND CHEMICAL CORPORATION
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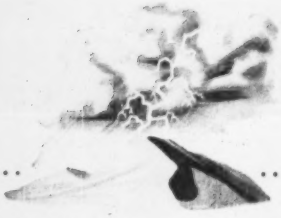
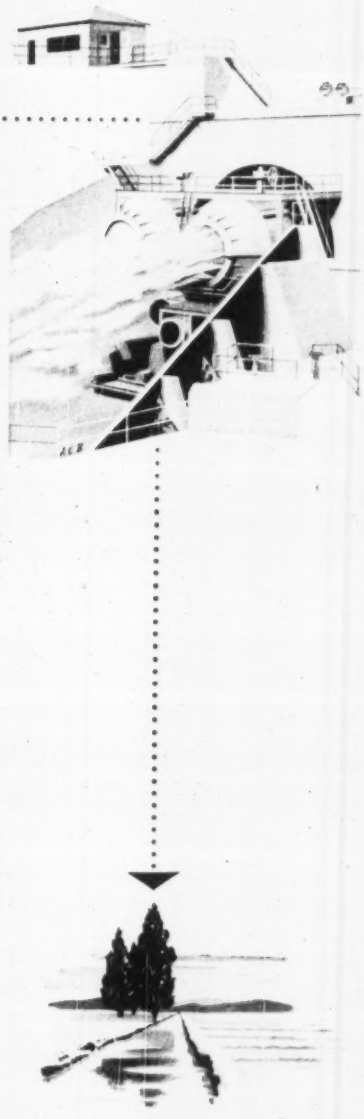
ONE OF A SERIES DEMONSTRATING APPLIED LUKENOMICS

YARDSTICK FOR A FLOOD... or how to insure years of accurate Venturi-metering in giant penstocks





Accurate regulation of fast-flowing debris-laden water in San Gabriel Dam No. 1—world's greatest earth- and rock-filled structure—posed an important engineering problem. Four specially designed nickel-clad steel Venturi tubes were finally specified and installed. Designed for maximum discharge, these tubes have much higher throat velocities than ever before used and a differential pressure of about 22 feet of water between inlet and throat. Although tubes were of welded construction, riveted joints, with ¼" space between throats and inlets and outlets, were used in the tunnel sections to facilitate replacement, if required. Uniqueness of the installation required development of special flow measuring instruments using mercury. This Venturi design has been entirely satisfactory in over 13 years of operation giving consistent accuracy of metering with minimum maintenance.

Advances in structural design have resulted in increased efficiency . . . lower maintenance and operating costs . . . improved performance. Many improvements have been the result of close cooperation between designer, engineer, fabricator and materials supplier. We call this *Lukenomics*. Such an approach is at your disposal to help solve your cost and amortization problems along with other vital considerations.

To obtain the advantages of equipment built by fabricators applying the Lukenomics principle, write our Manager of Marketing Service, Lukens Steel Company, 513 Lukens Building, Coatesville, Pennsylvania.

San Gabriel Dam No. 1 was constructed by Los Angeles County Flood Control District. Lukens Nickel Clad Steel was selected for Venturi tubes because of the severe corrosive and erosive action of silt- and debris-laden flood waters.

LUKENS

LUKENS STEEL COMPANY

BETTER PRODUCTS FOR BETTER EQUIPMENT

MATERIALS AND LABOR PRICES

Market quotations on construction materials and wage rates reported monthly by ENR correspondents
July Materials and Labor Prices will appear in the July 6, 1950 issue

CEMENT, AGGREGATE, READY-MIXED CONCRETE—F. O. B. CITY

	PORTLAND CEMENT*			SAND AND GRAVEL			CRUSHED STONE		CRUSHED SLAG		CONCRETE BLOCK	CONCRETE
	Per bbl. C.L. lots incl. $1.00 per bbl. for bags, cash disc. not deducted			Per ton, carload lots			Per ton, carload lots		Per ton, carload lots, f.o.b. plant		8 x 8 x 16 in., truckload del. per block	Ready Mixed 1:2:4, over 50 cu.yd. del.
	Cloth	Paper	Bulk	Gravel, 1½ in.	Gravel, 3 in.	Sand	¾ in.	2 in.	¾ in.	2 in.	Sand, gravel	Lt. wgt. agg.
Atlanta	$4.16	$3.41	$3.10	$2.00	$2.00	$1.75	$2.50	$2.10	$1.65	$1.85	$0.1725	$0.1725	$11.00
Baltimore		3.39	3.14	2.40‡a	2.40‡a	1.95‡a	2.60‡a	2.70‡a	2.45‡a	2.45‡a	.16	.16a	10.25
Birmingham	3.80	3.00	2.68	2.21	2.21	1.81	2.50	2.50	1.80	1.20	.145	.145	7.75
Boston		3.67	3.41	2.50a	2.50a	2.50a	1.90a	1.70a			.106	.205a	10.45A
Chicago	3.83/3.99	2.92/2.96	2.68/2.74	2.75‡b	2.75‡b	8.20‡b	2.75‡b	2.75‡b	2.00‡	2.00‡	.20	.206	9.70
Cincinnati	4.14	3.34	3.08	1.75‡c	1.75‡c	1.85‡c	2.00‡b	2.00‡b	1.80	1.80	.185	.205	11.65d
Cleveland	3.83	3.03	2.75	1.96‡	1.65‡	1.55	3.55‡a	3.55‡a	2.75‡	2.75‡		.22	11.80g
Dallas	3.54	2.74	2.49	2.00	2.15	1.75	2.10	2.15			.086e	.125	9.30
Denver		3.54	3.29	1.85	2.00	1.15					.20	.22a	9.65
Detroit		2.98	2.73	2.25‡h	2.25‡h	3.00‡i	2.75‡i	3.00‡	2.75‡i	3.00‡	3.00‡	.17	.18a	9.85
Kansas City	3.93	3.13	2.88	1.90	1.90	1.50‡	1.90‡j	1.90‡j			.17a/g	.215e	10.40k
Los Angeles		3.72‡l	3.32‡l	1.94‡k	2.94‡k	1.74‡a	1.92‡a	1.92‡a			.127	.210	10.01A
Minneapolis	4.13‡d	3.33‡d	3.07‡d	2.30‡a/c	2.30‡a/c	2.30‡a/c	2.40‡a/c	2.40‡a/c			.21e		10.45‡i
Montreal		2.45‡e	2.31‡e		2.50‡b	2.10‡b	.80‡j	1.10‡j			.22	.20a	9.05‡d
New Orleans		3.05‡	2.70‡	2.32	2.32	1.82			1.05	1.25	.25		12.40
New York	4.29	3.49	3.24	2.10‡d	2.10‡d	1.45‡d	2.35‡d	2.35‡d					10.50‡g
Philadelphia	3.93/4.23‡	3.13/3.43‡	2.87/3.17‡	2.45‡	2.55‡	2.05‡	1.90‡	1.95‡	1.50	1.50	.18/.22		10.80
Pittsburgh	3.90	3.18	2.85	2.05‡	2.05‡	2.10‡	2.50‡	2.50‡	2.05	2.05	.214	.214	10.85
St. Louis		2.99/3.05‡	2.80	2.40‡a/m	2.40‡a/m	2.40‡a/m	1.60‡	1.60‡	1.15	1.15	.215	.24‡a	9.40
San Francisco		3.39	2.99	1.80	1.80	1.80	1.90					.25e	10.15e
Seattle		3.55a	3.05a	2.75‡b/m	2.75‡b/m	2.75‡b/m	3.50‡b/m	3.50‡b/m			.221	.3135‡	10.25‡

† Delivered. * Prices incl. dealers comm. except as noted. ‡ Truck lots. a Cash disc. not allowed. b Less 2% for cash. c Less 5% for cash. d Less 10% for cash. e Less 2½ for cash. f Less 15% for cash. g Less 2% for cash.

CEMENT: a Subj. to 10¢ disc. b Less 2% for cash. c C.I. price dealers' comm. not incl. d Dealers sell only 12 lots. e Plus switching charges.

SAND, GRAVEL, STONE & SLAG: a Truck lots. b Per cu. yd. c 3/8 in. or more. d 1¼ in. e Pea gravel. f Less 5% for cash. g Less than 5 tons. h Less 2½ for cash. i Less than 5 tons. j Less 10% for cash. k Plus 2% sales tax incl. l f.o.b. pits. m Barge lots used. n f.o.b. screw. Hold. o Less 2% for cash.

CONCRETE BLOCK: a Cinder. b Waylite. c Haydite. d Celocrete. e 12 x 8 x 12 in. f 8 x 4 x 16. g f.o.b. truck at job. h Less 2% for cash. i Less 1% for cash.

READY MIXED CONCRETE: a 5 cu. yds. or over del. Mass. b 25 cu. yds. or more. c 10-100 cu. brackets. d Truck loads up to 500 cu. yds. e 2,000 lb. comp. f 2,500 lb. comp. g Aver. haul 7-9 mi. zone. h Less 50¢ for cash. i 5% off for cash. j 2% off for cash. k Sales tax included. l 1:2:4.

CASH DISCOUNTS: CEMENT to Contractors: Truck delivery, 2% for cash on 10th of month; on carload deliveries, no trucking, same as dealer cash discount 10¢ per bbl. for payment within 15 days of date of invoice. Subject discount 10¢ per bbl. 20 days in Montreal.

CURRENT MAXIMUM PRICES AT CEMENT MILLS

Charge for bags not included. For cloth bags, add $1.05 per bbl. 25¢ refund allowed for each returnable bag; for paper bags add 25¢ per bbl., not refundable.

	Bulk		Bulk		Bulk		Bulk
Richard City, Tenn.	$2.40†	Buffington, Ind.	$2.30	Stockton, Minn.	$2.40	Muskegon, Mich.	$2.50†	Toledo, O.	$2.40†
Cinnebird, Ga.	2.40	Independence, Kan.	2.40	Lewis, Va.	2.25	Saginaw, Mich.	2.35†	Milwaukee, Wis.	2.50†
Kingsport, Tenn.	2.40†	Bellefonte, Mo.	2.35	Bellefonte, Mich.	2.40	Bellefonte, Mich.	2.40†	Green Bay, Wis.	2.50†
West Des Moines, Iowa	2.45†	Northampton, Pa.	2.40	Hudson, N.Y.	2.40	Buffalo, N.Y.	2.40†	Ironton, O.	2.30
Nazareth, Pa.	2.40†	Universal, Pa.	2.40	Algonac, Mich.	2.25†	Oswego, N.Y.	2.60†	Montreal City	2.13
Bath, Pa.	2.40†	Waco, Tex. (+ 10¢ tax)	2.30	Detroit, Mich.	2.40†	Cleveland, O.	2.40†	W. Winfield, Pa.	2.40†

*Prices to hold for second quarter of 1950.

PAVING BRICK, BLOCK, ASPHALT, ROAD OILS—F. O. B. CITY

	PAVING BRICK AND BLOCK			PAVING ASPHALT		ASPHALT BINDERS—FLUXES		CUTBACK ASPHALT		ROAD OIL	ASPHALT EMULSION (Quick breaking)
	Granite, Per M lots of 50,000 4x8x8 in.	Brick, per M, 3x4x8½ in.	Wood, per sq. yd. 3½ in.	Per ton, less than 80 penetration		Per gal., 80-100 penetration		Per ton		Per gal.	Per gal.
				Tank car	Drums	Tank car	Drums	Tank car	Drums	Tank car	Tank car	Drums
Atlanta	$73.00	$55.00	$2.25									
Baltimore	150.00‡	57.70‡		$21.00		$.085	$0.14	$.085	$.16	$.085	$.085	$0.11
Birmingham		32.50										
Boston				24.50a	$35.50a	103‡a	185a	115a/e	205a/e	10a	113a	295a
Chicago	155.00‡a	85.00/88.00‡b	2.70/3.50‡f	20.25/	30.25/	19.25/e	29.25/e	.0875/e	.16/e	.0756	.1025/.1075/e	.15/.1675/f
Cincinnati				19.00‡		.085	.085	.085/e				
Cleveland		49.00‡	3.43‡	24.00	33.50	24.00/e	33.50/e	.10/e	.22/e	.10	.13	.25
Dallas	e	40.00	e	23.95	42.95	.1012	.1898	26.90/e	47.97	.0887	.1062	.1423
Denver		48.00						.0950/e				
Detroit				26.65		12.00/e		.0950/e		.092		.187
Kansas City		40.00‡d		18.05‡d				.07/e	.075/e	.0585‡e		
Los Angeles	e		e	12.50‡m		12.50‡n		14.00‡		12.50‡n	.0775‡j	.1575‡j
Minneapolis			2.83A	25.50	36.00	24.00/e	35.00/e	24.00	35.00	.09	.12	.22
Montreal	137.00	e	e	27.00/n	36.05/e	16.70/n/e	18.70/n/e	16.00/e	18.30/e	13.20/e‡	.174/e	.215/e‡
New Orleans				16.50/e		16.50/e		.0850/e		.0775	.08	.1425/e
New York			2.35‡f	24.50	35.50‡j	22.50/e	41.88‡j/e	.1040/e	.1767‡j/e	.0800	.0940	.1747‡j
Philadelphia	150.00	110.00	4.00	23.00		22.00/e		.0850/e				
Pittsburgh	165.00	42.00	4.50	22.00	35.00	.10	.22	27.00	39.00	.085	.09	.20
St. Louis				19.25‡		.0835/e		15		.15		
San Francisco		62.75e		14.50/g	30.00/g/p	14.50/e		16.50/e			.08	.14
Seattle				14.50A	35.00A	15.00/e		.1150/e	.2050/e	.16.00/e	.085	.095

‡ Delivered.
PAVING BRICK & BLOCK: a C.L. b 3½ x 4 x 8½. c 2½ x 5½ x 8. d f.o.b. E. Palo, Kans. e Not used. f 2½" interior 6¢ treat. g 3" 6.50 treat.
ASPHALTS: a Price at plant, Everett, Mass. b f.o.b. refinery, Lovelaceton, Ill. c f.o.b. Sugar Creek, Mo. d f.o.b. refinery, El Segunda. e f.o.b. Baton Rouge. f f.o.b. Wood River or Roxana, Ill. g f.o.b. Richmond, Calif. h f.o.b. Martinez. i Bulk, refinery. j f.o.b. refinery, Englewood, Calif. k 50-110 penetr. l Less than 100 penetr. m 40-50 penetr. n Tax incl. o Drums not avail. p Shipped in steel bbl. q Use of steel drums. r In customer's drums. s Shipped in drums, per drum. t 55-gal. drums. u Per 100 gal. v Per ton. w Per gal.

IRON AND STEEL PRODUCTS—PER 100 LBS. BASE MILL PRICES

	STRUCT SHAPES PLATE	REINF. BARS billet	RIVETS ½ in. struc tural	SHEET PILING	STEEL RAILS Per Net Ton Standard	Light	Re-rollet	TRACK SUPPLIES Angle Bars	Std. Spikes	Tie Plates	Track Bolts
Birmingham Area	$3.40	$3.45	$7.25		$68.00	$75.00	Not	$4.40	$5.00	$4.20	
Chicago Area	3.40	3.45	7.25	$4.20	68.00	75.00	avail	4.40	5.00	4.20	
Pittsburgh Area	3.40	3.45	7.25	4.20	68.00	75.00	able	4.40	5.00	4.20	
Buffalo Area	3.45	3.45	7.25	4.20	68.00	75.00		4.40	5.00	4.20	$8.85
Cleveland			7.25								8.85
Youngstown Area		3.45							5.00		
Geneva	3.40										
Los Angeles		4.17							5.00		
Pueblo	3.40	3.45			68.00	75.00		4.40	5.00	4.20	8.85

IRON AND STEEL PRODUCTS—F. O. B. WAREHOUSE, PER 100 LBS., BASE PRICE

	STRUCTURAL SHAPES Per 100 lb base price	5 tons to carload lots New billet	REINFORCING BARS Per 100 lb. base price Rail steel	Axle switch	$ cwt. for Del.	EXPANDED METAL LATH Per 100 sq. yd., carload lots Std. diamond mesh, 3.4 lb.	Std. ribbed 3.4 lb.	WELDED FABRIC REINFORCING Per 100 sq. ft., carload lots 4x16 in., No. 5 & 10 wires	4x12 in., No. 8 & 12 wires	6x6 in., No. 6 & 6 wires
Atlanta	$5.83[1]	$5.225	$5.225[2]	$.025	$.10	$31.50	$31.50			
Baltimore	6.10	5.60[3]			.10	40.00	41.00			
Birmingham	5.4	5.5	5.25	.05	.15	42.00[4]	44.50[4]			
Boston	5.75[5]	5.50[6]	5.50[6]		.10/.15	31.00	33.00	A F M • Joliet, Illinois, Donora, Penn. $2.10 F.o.b. Mill Monessen, Penn. $2.10	A F M • Joliet, Illinois, Donora, Penn. $2.10 F.o.b. Mill Monessen, Penn. $2.10	A F M • Joliet, Illinois, Donora, Penn. $2.10 F.o.b. Mill Monessen, Penn. $2.10
Chicago	5.25[7]	4.50[8]	4.50[8]	.0025		32.00[2]	34.50[2]			
Cincinnati	5.70[9]	5.51[10]				34.00[2][11]	36.50[11]			
Cleveland	5.37	4.47			.10	34.00	36.50			
Dallas	6.7	5.4[12]	5.30			43.50	46.00			
Denver	6.05	5.75[13]				48.00[4]	51.00[14]			
Detroit	5.84[15]	5.10[16]			.10	35.00	43.50			
Kansas City	5.55[17]	5.10[18]				39.00[4]	41.00[4]			
Los Angeles	5.70[19]	5.30[20]			.15	38.00[21]	40.00[21]			
Minneapolis	5.61[22]	6.12[23]	6.12[23]		.15	34.00	36.50			
Montreal	6.75[24]	4.75[25]	4.75[25]			44.10[26]	46.80[26]			
New Orleans		5.40[27]		.05	.10	38.50	41.00			
New York	5.63	5.38	5.33		.20	35.50[28]	38.00[28]			
Philadelphia	5.70[29]	5.50[30]				35.50[2]	38.00[2]			
Pittsburgh	5.40[31]	5.10[32]			.10	32.50[2]	34.50[2]			
St. Louis	5.58	4.55[33]	4.55[33]			42.00[34]	48.00[34]			
San Francisco	6.00[35]	5.75[36]			.15	37.50	40.00			
Seattle	4.05[37]	5.35[38]				52.00[39]	42.00[39][40]			

• All Producing Mill

[1] Delivered. [2] 5 tons and up. [3] Less than 1 ton add 50c. [4] 20 tons or over base. [5] 5 to 10 tons. [6] 5 to 15 tons base. [7] Del. of 5000 sq. yd. or less, add 50c. [8] Del. of 5000 sq. yd. or less, add $1.00. [9] 5 tons or over. [10] F.O.B. mill. [11] Asphalt coated. [12] Net. Per keg of 25 lb. [13] 10 tons or over. [14] Painted, add 25c per 100 lb. [15] 5 tons or more. [16] 5 to 14 tons. [17] 5 tons or over. [18] 5 to 15 tons. [19] 5 tons or more. [20] 5 to 15 tons. [21] 10 tons or over. [22] 5 tons or more. [23] 5 to 14 tons. [24] Del. Montreal. [25] 5 to 15 tons. [26] 10 tons or over. [27] 5 to 10 tons. [28] 5 to 19 tons. [29] 5 tons or more. [30] 5 to 14 tons. [31] 5 tons or more. [32] 5 to 14 tons. [33] 5 to 19 tons. [34] 5 to 9 tons. [35] 5 tons or more. [36] 5 to 14 tons. [37] 5 tons or more. [38] 5 to 14 tons. [39] 5 to 9 tons. [40] Painted, add 25c per 100 lb.

PLUMBING, HEATING, WATER, SEWER AND DRAIN PIPE

	C. I. PIPE Per net ton f.o.b. 6 in to 24 in	std. 8 in	VITRIFIED SEWER PIPE Per foot, Delivered ASTM C13-44T std. 12 in	24 in	36 in	CLAY DRAIN TILE ASTM C4-24 Per 1,000 ft., car load lots f.o.b. 6 in	8 in	CONCRETE SEWER PIPE Per ft., del. covered; ASTM C 14-41 12 in	24 in
Atlanta	$80.50	$0.41	$0.67	$1.00	$7.00	$114.00	$140.00	$0.45	$2.00
Baltimore	93.86	4.05	8.75	1.69	9.94	150.00	195.00	.70	2.25
Birmingham	82.50	4.00	.72	2.84		210.00[2]	275.00[2]	.60	2.50
Boston	97.46	4.13[3]	8.35[3]	3.69[3]	10.10[3]	173.00	267.00	.452[4]	3.60[2][4]
Chicago	90.40	.54	1.08	4.25	13.25	156.00[2]	170.00[2]	.70	2.35
Cincinnati	94.00	.455	8.75	3.555	10.30	160.00[2]	187.50[2]	.60	3.25[2]
Cleveland	97.13	.57[5]	.72[6]	.91[6]	8.21[5][7]	140.00	253.00	.72[6]	2.75[6]
Dallas	99.28	.365	.657	2.85	9.25			.49	1.60
Denver	104.36	.414	.714[8]	2.36[8]				.744[8]	2.34[8]
Detroit	92.1	.63	1.05	4.30	12.[9]	200.00[10]	10.00[11]	.65	.50
Kansas City	98.41	.418[12]	.74[9]			215.00[10]		.60[9]	.50[9]
Los Angeles	111.06	.436	.917	4.302	.298	193.00[2]	324.00[2]	.72	2.05[2]
Minneapolis	91.86-100.67	.62[13]	1.12[13]	3.53[13]				1.29[8]	3.67[8]
Montreal	90.00	.77[8]	1.35[8]	3.42[8]	7.23[8]			72.00[14]	218.00[14]
New Orleans	92.68	.43	.82	4.43	8.85[15]	235.00[16]	412.00[16]	.65	2.29
New York	92.50-97.50	.55	1.00	3.75	9.00			1.00	2.50
Philadelphia	90.47	.44	1.00	4.15	10.25	210.00[2]	300.00[2]	1.35[8]	3.10[8]
Pittsburgh	97.76	.70[17]	.70[17]	.70[17]	9.45[18]	147.50	240.00	1.05[8]	2.50[8]
St. Louis	94.27	.48	.92	3.80	9.00			.70[8]	2.45[8]
San Francisco	111.06	.55[19]	1.05[19]	4.65[19]	11.25[19]	193.00[2]	325.00[2]	.69	2.85
Seattle	112.98	.515	.91			150.00		.81[20]	2.40[20]

‡ Delivered. [1] B. & S. sizes. [2] Extra heavy. [3] Class A. [4] Reinforced. [5] Class B. [6] Class A. [7] 60 in. [8] Class C. [9] Class B. [10] Standard. [11] 10 in. [12] Class A. [13] Class A. [14] Class A. [15] 48 in. [16] Class A. [17] Class A. [18] 60 in. [19] Class A. [20] Class A.

*WROUGHT STEEL PIPE (Full standard weight)

	Mill	Butt Weld, Black	Butt Weld, Galv.	Lap Weld, Black	Lap Weld, Galv.	Extra Strong, Plain Ends	Double Extra Strong, Plain Ends
Lorain, Ohio		48	48				
Aliquippa, Pa.		48	48				
Sharpsville, Pa.							
Benwood, W. Va.							
Youngstown, O.							
Indiana Harbor, Ind.							
Gary, Ind.							
Conshohocken, Pa.							
Wheatland, Pa.							
Erie, Pa.							
Ambridge, Pa.							

(Threaded and coupled. Add 35% for 4 in. and smaller. All extra over Butt Weld, Black.)

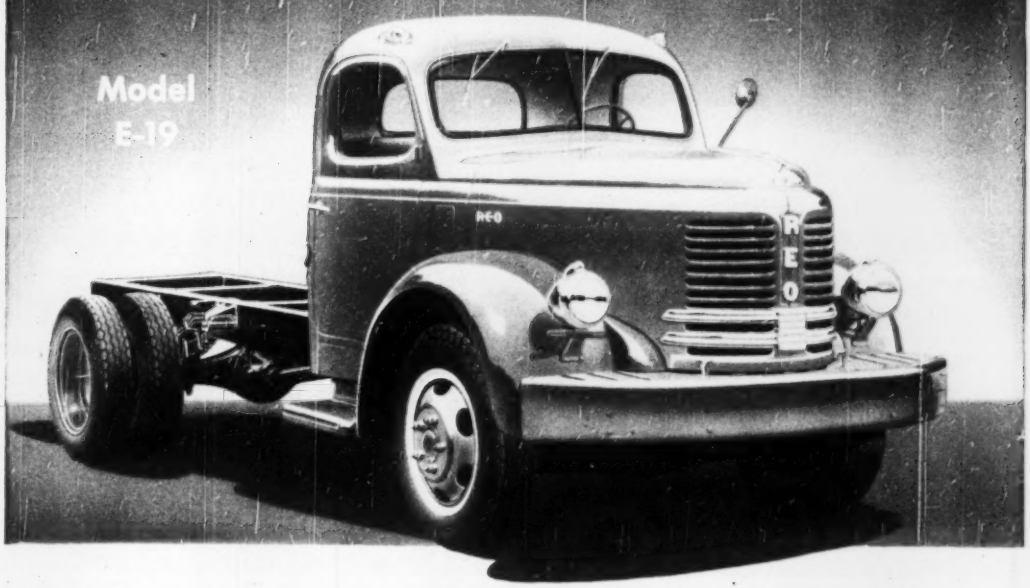
‡ Delivered. ‡ B. & S. sizes. [1] Class A. [2] Class B. [3] Class A. [4] Class B. [5] Class A. [6] Class B. [7] Class A. [8] Class B. [9] Class A. [10] Class B. [11] Class A. [12] Class B. [13] Class A. [14] Class B. [15] Class A. [16] Class B. [17] Class A. [18] Class B. [19] Class A. [20] Class B.

*WROUGHT STEEL PIPE—Discounts from standard list prices are carload prices. Base price applies $200 per net ton. List prices per ft. Butt Weld, ⅛ in. 56c; ¼ in. 56c; ⅜ in. 56c; ½ in. 81c; ¾ in. 11c; 1 in. 17c; 1¼ in. 25c; 1½ in. 37c; 2 in. 52c; 2½ in. 79c; 3 in. $1.12; 3½ in. $1.29; 4 in. $1.48; 4½ in. $1.67; 5 in. $1.85; 6 in. $2.22. Freight rates to destination to be added to price + 3 percent tax on transportation.

WROUGHT IRON PIPE—Base prices per ft. same as steel list prices. Discounts from carload list price. Butt Weld, Black, ⅛ in. +65%; ¼ in. +65%; ⅜ in. +65%; ½ in. +65%; ¾ in. +65%; 1 in. +65%; 1¼ in. +65%; 1½ in. +65%; 2 in. +65%; 2½ in. +65%; 3 in. +65%; 3½ in. +65%; 4 in. +65%; 4½ in. +65%; 5 in. +65%; 6 in. +65%; 7 in. +65%; 8 in. +65%; 9 in. +65%; 10 in. +65%; 11 in. +65%; 12 in. +65%. Lap Weld, 1½ in. +65%; 2 in. +65%; 2½ in. +65%; 3 in. +65%; 3½ in. +65%; 4 in. +65%; 4½ in. +65%; 5 in. +65%; 6 in. +65%; 7 in. +65%; 8 in. +65%; 9 in. +65%; 10 in. +65%; 11 in. +65%; 12 in. +65%. Freight rates to destination to be added to price delivered.

(Continued on page 94)

NEW 1950
REO SPEED WAGON*



A real trailblazer for price and performance in the versatile, ton-and-a-half field.

- 14,500 lbs. GVW
- Reo-built engine
- 245-cu. in., seven-bearing
- Extra-heavy frame
- 100 per cent truck!

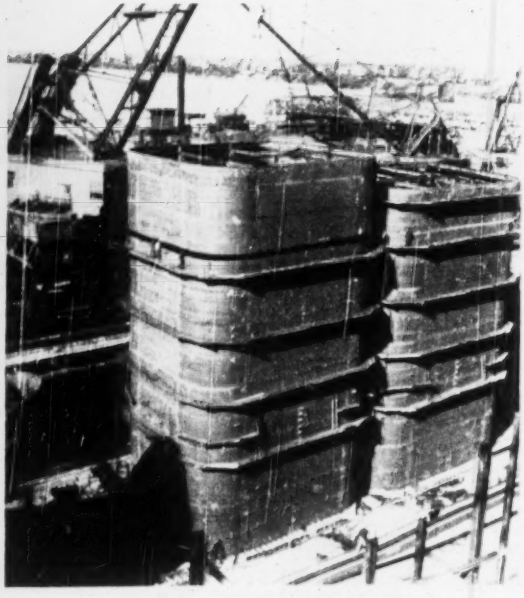
$1631.00 PLUS TAXES

Complete chassis and cab . . . 6.50 x 20 dual rear tires (larger sizes available). F.O.B. Lansing, Mich., plus taxes.

REO
TRUCKS AND BUSES

REO MOTORS, INC.
LANSING 20, MICH.

*Trademark Registered



FLOATING A 2000 TON BRIDGE CAISSON

The caissons shown at the left are two of six being built at Newport News for the York River Bridge in Virginia. They are fifty-two feet by sixty-six feet in cross section and were built to a height of 110 feet. During construction sixteen feet of concrete was poured around the six dredging wells of the bottom sections of the caissons for stability in floating. They were floated from the dry dock in which they were constructed and towed to the site of the bridge fifty-seven miles away.

In addition to caissons many other types of heavy equipment have been built at Newport News in recent months. The plant extending over 240 acres, includes complete machine, casting, forging and other facilities which offer all of the advantages for the execution of the complete job. Your inquiries are invited.

WRITE FOR ILLUSTRATED BOOKLET "FACILITIES AND PRODUCTS"

NEWPORT NEWS
Shipbuilding and Dry Dock Company
Newport News, Va.

LUMBER, TIMBER, PLYWOOD—PER M FT. B.M., CARLOAD LOTS F. O. B.

SHORT LEAF YELLOW PINE AND DOUGLAS FIR

All S. L. Y. P. is No. 2 common or better and for No. 1 N. C. Box. Prices in Bold Face: All Fir boards, dimension, planks No. 2 Fir, small timbers and timbers are No. 1. Lengths up to 40 ft. Prices in metro.

	1x6 S4S	1x8 S4S	2x4 S4S	2x6 S4S	2x8 S4S	2x10 S4S	3x12 S4S	6x12 S4S	12x12 S4S
Atlanta	† $70.00	$71.00	$60.00	$62.00	$65.00	$68.00	$70.00		
Baltimore	70.00	75.00	60.00	60.00	60.00	68.00	90.00		
	[illegible]	*[illegible]*	*[illegible]*	*[illegible]*	*[illegible]*	*[illegible]*	*[illegible]*	*[illegible]*	*[illegible]*
Birmingham	† 73.00	76.00	63.00	65.00	68.00	75.00	85.00		
	65.00	65.00	60.00	60.00	60.00	60.00	85.00	85.00	85.00
Boston*	86.00	86.00	92.00	91.00	91.00	90.00			
	95.95	95.95	85.85	85.85	85.85	100.105	101.105	101.105	101.105
Chicago	‡ 91.92	92.93	82.83	91.92	93.94	95.96	100.00		
	‡[illegible]	*[illegible]*	*[illegible]*	*[illegible]*	*[illegible]*	*[illegible]*	105.00	110.114	110.114
Cincinnati	78.00	88.00	88.00	88.00	88.00	96.00	105.00		
	90.00	90.00	90.00	90.00	90.00	90.00	90.00	130.00	130.00
Cleveland	90.00	92.00	85.00	90.00	92.00	94.00	100.00		
Dallas	15 60.00	66.00	61.00	53.00	56.00	57.00	90.00		
Denver	105.00	105.00	105.00	110.00	110.00	110.00	115.00	115.00	150.00
Detroit	95.00	97.00	80.00	88.00	92.00	93.00			
	140.00	140.00	140.00	140.00	140.00	140.00	155.00		
Kansas City	105.00	111.50	115.00	112.00	115.00	120.00			
	‡ 110.00	112.00	110.00	110.00	110.00	110.00	120.00	155.00	155.00
Los Angeles	* 105.00	105.00	101.00	101.00	101.00	101.00	115.00	125.00	135.00
Minneapolis	24 105.00	110.00	110.00	110.00	110.00	110.00	155.00	155.00	155.00
Montreal	28 70.00	74.00	70.00	72.00	75.00	83.00			
	140.00	140.00	140.00	140.00	140.00	140.00	155.00		
New Orleans	† 75.00	78.00	74.00	75.00	78.00	83.00	100.00		
	† 77.00	77.00	75.00	78.00	78.00	78.00	77.00	77.00	100.00
New York	‡ 102.50 110.105	112.50	105.115	105.115	110.120	115.125	125.135		
	‡			Range from $125.00 to $141.00			125.135	135.145	135.145
Philadelphia				**Range from $88.00 to $97.00**			88.97		
				Price from $120.00 to $126.00			130.120	130.130	130.130
Pittsburgh	† 75.85	75.85	80.85	75.85	75.85	80.90	100.00		
	† 90.00	90.00	90.00	90.00	90.00	90.00	120.150	120.00	120.00
St. Louis	‡ 97.00	99.25	86.50 92.50	94.25†	99.65 99.75	103.105†			
	‡		110.00 112.50	110.00	118.00	118.00	125.00	125.00	125.00
San Francisco	† 85.00	85.00	85.00	85.00	85.00	85.00	85.00	85.00	85.00
Seattle	† 75.00	75.00	75.00	75.00	75.00	75.00	75.00	75.00	75.00

† Rough only. ‡ Delivered. § Retail-LCL. ¶ Yard prices.

‖ MIXED: **Bold Face type, Southern Pine.** *Italics, Douglas Fir.* a Spruce & Tax except. b M lots. c 8-12 ft. lengths. d 8-16 ft. lengths. e 18-ft. lengths. f 18-ft. or under. g No. 1 common. h 8-12 ft. lengths. i 8 ft. lengths. j 16-ft. lengths. k No. 3 common. l 14-16 ft. lengths.

* PLYWOOD: Special concrete form grade Fir Plywood, 4 ft. by 8 ft. panels.

LONG LEAF YELLOW PINE

Merchantable grade up to 20 ft.

	2x12 S4S	12x12 S4S
Atlanta		
Baltimore	$140.00	$140.00
	[illegible]	*[illegible]*
Birmingham	115.00	125.00
Boston*		
Chicago	114.00	114.00
Cincinnati		
Cleveland		
Dallas	116.118	116.118
Denver		
Detroit	88.00	88.00
Kansas City	97.00	
Los Angeles		
Minneapolis		
Montreal		
New Orleans	130.00	130.00
New York		
Philadelphia	210.240f	210.240f
Pittsburgh	180.00	180.00
St. Louis		
San Francisco		
Seattle		

PLYWOOD

Rail freight increment (See note for base price)

	¼"	⅜"
Atlanta	$22.32	$27.24
Baltimore	22.80	27.90
	[illegible]	*[illegible]*
Birmingham	21.78	26.58
Boston*		
Chicago	22.86	27.90
Cincinnati	18.72	22.80
Cleveland		
Dallas	21.78	26.58
Denver		
Detroit	21.78	26.58
Kansas City		
Los Angeles	16.56	20.16
Minneapolis		
Montreal	13.38ab	16.26ab
New Orleans	16.56	20.16
New York		
Philadelphia	22.86	27.90
Pittsburgh	22.86	27.90
St. Louis		
San Francisco	22.86	27.48
Seattle	18.72	22.80
	[illegible]	*[illegible]*
San Francisco	10.08d	12.30d
Seattle		

‡ Split, vertical grain, water resistant glue, carload lots delivered per 1,000 sq. ft. surface. Seattle base price on ¼" $16.00 on 2" $20.00. For other centers add rail freight increment from table on proper size. Oiling and edge sealing charges included. a Lower rate by water shipment. b 5,000 sq. ft. minimum.

* Freight rate increase of 1¢ per cwt., not included in these figures.

GLASS, EXPLOSIVES, CHEMICALS

WINDOW GLASS

Discounts from jobbers' list Dec. 1, 1949:

	Single or Double Thickness A quality	Single or Double Thickness B quality
Atlanta	76%	76%
Baltimore	80-10%	80-10%
Birmingham	80%	80%
Boston	80%	80%
Chicago	81%	81%
Cincinnati	81%	81%
Cleveland	80-10-10%	80-10-10-10%
Dallas	75%	75%
Denver	78%	78%
Detroit	80-10-10%	80-10-10%
Kansas City	65-10%	65-10%
Los Angeles	80%	80%
Minneapolis	80%	80%
Montreal	40-5%	40-10-5%
New Orleans	80%	80%
New York	80%	80%
Philadelphia	80%	80%
Pittsburgh	80%	80%
St. Louis	70-10%	70-10%
San Francisco	60%	70%
Seattle	80%	80%

EXPLOSIVES

Per lb. 40% Ammonia Gelatin in 50 lb. cases delivered in 200 lb. lots*

Atlanta	$0.2025
Baltimore	.2025
Birmingham	.1725
Boston	.2025
Chicago	.2025
Cincinnati	.2025
Cleveland	.2425
Dallas	.215
Denver	.2175
Detroit	.2225
Kansas City	.2175
Los Angeles	.21
Minneapolis	.2075
Montreal	18 1/4c
New Orleans	.2125
New York	.22
Philadelphia	.2025
Pittsburgh	.1725
St. Louis	.2075
San Francisco	.2075
Seattle	.21

Price of 60% Ammonia Gelatin is $0.0125 per lb. higher than 40%.

a Glass, jobbers' list price per box 14 x 20 is $12.76 for A quality, $17.50 for B quality; 14 x 26 is $16.56 for A quality, $22.70 for B quality. b Discount from list Sept. 1949, sales tax included, but 4% tax exemption not allowable for single thickness. c Discount from list of Jan. 1, 1949. d In 60 to 100 lb. drum lots. e 25 lb. kegs.

* Explosives: Urban prices are delivery only; carriers charges at point of storage and delivery regulations. Rural prices are for delivery at nearest point in non-congested areas. In the case of Kings, Queens and Richmond and in Manhattan south of Canal St., add delivery charge of $0.00 per ton. † Lots over 100 lb. Quotes are for 50 lb. kegs. ‡ Delivered Rural, Municipal.

40% Ammonia Gelatin price ranges in other than urban areas, per lb. except Seismograph Grades

	50 lb. or 200 lb. net	Tons	200 lb. lots
E. of the Miss. except Fla. and Me.	$0.155	$0.1825	$0.2025
W. of Miss. to Rocky Mtn. States			
Fla. and Maine	16 - 1675	1875 - 20	2075 - 22
Rocky Mtn. States	16 - 1725	1875 - 20	2075 - 225
Pacific N. W. states	1575 - 17	19 - 2025	21 - 2225
Pacific S. W. States	155 - 1625	1875 - 195	2075 - 2175

PILES, TIES F. O. B.

PILES

Prices per linear foot, fir and pine, bark off, f.o.b. cars, New York. Fir based on Wash. and Ore. points to New York shipping area; pine based on freight from Norfolk.

Dimensions	Points	By Rail—Length	Pine*	Fir
12-in. at butt	6-in.	30 to 50-ft.	$0.41	....
12-in.—2-ft. from butt	6-in.	50 to 55-ft.	.46	....
12-in.—2-ft. from butt	6-in.	60 to 60-ft.	.60	....
12-in.—2-ft. from butt	6-in.	90 to 100-ft.	....	.79
13-in.—3-ft. from butt	5-in.	95 to 100-ft.	....	.80
14-in.—2-ft. from butt	6-in.	50 to 60-ft.	.50	.87
14-in.—2-ft. from butt	6-in.	70 to 75-ft.	.54	.91
14-in.—2-ft. from butt	5-in.	80 to 85-ft.	.67	.92
14-in.—2-ft. from butt	5-in.	85 to 86-ft.	....	.93
14-in.—2-ft. from butt	5-in.	90 to 100-ft.	....	.97

* Pine piling over 80-ft. available only in limited quantities.

RAILWAY TIES

Prices f.o.b. per tie for carload lots

		6"x8"x8' Untr.	6"x8"x8' Tr.	7"x9"x8'6" Untr.	7"x9"x8'6" Tr.
Boston	Oak, x				
	Pine, x				
New York	S. L. Sap Pine	$1.65	$2.85	$2.00	$3.30
	Mixed Oak	1.80	3.05	2.50	3.60
Birmingham	Hardwood	1.00	1.60a	....	2.25a
Chicago	Red Oak	2.50	2.60a	....	3.52 3.45a
Los Angeles	Douglas Fir				
	Redwood				
Philadelphia	Red Oak	2.30	3.15a	3.10	4.25a
St. Louis	White Oak	2.40		3.30	
	Red Oak	2.30	3.00a	3.10	3.90a
	Sap Pine or Cypress	2.80		3.65	
San Francisco	Douglas Fir	1.25c	2.24cf	1.70cf	3.05caf
Montreal	Birch or Maple	A	A	A	A

Tr. Treated. Untr. Untreated. x Creosoted. b 7"x9"x8'. c f.o.b. rail. e f.o.b. cars. f f.o.b. cars. A No constant price available. a Not available.

CHEMICALS

Water, sewage treatment, road work, f.o.b. carlots, New York

Bleaching powder in drums f.o.b. works per 100 lb.	$4.50
Chlorine cylinders, liquid, per lb. f.o.b. works	.08-.12
Calcium chloride, 77-80%, flaked, 100 lb. paper bag, f.o.b. works, ton	22.00
Silicate of soda, 52 deg. in drums f.o.b. works per 100 lb.	1.80
Soda ash, 58%, in paper bags per 100 lb. dense	1.35
Sulphate of aluminum, commercial, in 100 lb. bags f.o.b. works	1.50
Sulphate of copper, in bags, 99% per 100 lb. f.o.b. works	7.00

STRUCTURAL CLAY BUILDING TILE, BRICK AND LIME—DELIVERED

	STRUCTURAL CLAY TILE PARTITION—SCORED			STRUCTURAL CLAY TILE—LOAD BEARING—SCORED			BRICK		LIME		
	Per M, lots of 2,000 pieces or over			Per M, lots of 2,000 pieces or over			Per M, in quantity		Per ton, In paper, Carload lot,		
	3x12x12 in.	4x12x12 in.	8x12x12 in.	8x12x12 in.	10x12x12 in.	12x12x12 in.	Common hard mg	Straight hard	Hydrated finishing	Common hydrated	Pulverized, or lump
Atlanta							$25.00	$25.00	$19.00	$17.50	$17.50
Baltimore	$175.00	$185.00	$325.00	$380.00			33.00‡	39.00‡	26.00	29.00	
Birmingham	97.50	104.00	195.00	231.00			20.00‡	22.50‡g	24.74	16.30	
Boston	140.00‡	149.00‡	280.00‡	317.00‡			32.00‡	35.00‡	30.80‡	26.40‡	
Chicago	115.00	122.50	230.00				21.00	23.00	28.50	23.00	
Cincinnati	170.00‡	180.00‡	240.00‡dd	295.00‡			32.25‡	44.00‡	24.25‡	24.25‡	24.25
Cleveland	118.00ee	126.00ee	236.00ee				28.50	28.50	24.00	22.00	27.50ee
Dallas		110.00					18.75	33.25	21.80		
Denver							32.00	32.00	34.80hh	28.00hh	34.00hh
Detroit	117.08	124.88	234.15		$260.80	$332.22	32.50ee	31.00ee	28.50	26.50	
Kansas City	115.50	122.50		245.00	303.50	367.00	24.25‡a	24.25‡a	36.00‡p	32.00‡p	30.00‡p
Los Angeles	r	r	r	r	r	r	20.00‡		36.00	36.00	32.00
Minneapolis	158.00‡p	176.00‡p	330.00‡p	176.00‡ep			31.25‡ep	35.25	35.00‡hh	29.00‡hh	35.00‡hh
Montreal	115.00‡aq	125.00‡aq	255.00‡aq				25.50	35.50	22.40‡u		22.40
New Orleans	160.00	160.00	300.00				29.00		38.00	26.00	37.50
New York	118.20‡h	126.00‡h	173.30‡h	189.50‡hn			33.00		34.40	26.80	
Philadelphia	126.30	134.80	252.60	302.74	361.35	455.74	27.00	30.00	31.00	19.50	24.50
Pittsburgh	98.00	105.80	181.85	202.30	265.35	303.60	26.00	38.00‡g	24.00	19.00	2.97‡m
St. Louis	120.00	135.00	252.00	252.00	339.00		34.50‡af	32.50‡af	60.80‡aaap	60‡aaap	1.00‡aaqee
San Francisco	132.00‡a	148.50‡a	198.00‡ddda	148.50‡a			33.00		25.30	25.30	2.43‡m
Seattle	150.00ee	160.00ee		190.00eeee			32.00e	39.00e	34.00‡hh	34.00‡hh	3.60mhh

† F.o.b. yard Roxbury. ‡ Smooth. § Per 50-lb. bags. ¶ 6 x 12 12 in. 3-roll. ** Pulverized hot. †† 5% 10th following month. ‡‡ 5¼ x 8 x 12. §§ F.o.b. trucks, job site N.Y.C. ¶¶ F.o.b. warehouse only. ‡‡‡ Truck load or over. §§§ $1.00 discount. ¶¶¶ Red face. ‡‡‡‡ Per 144 380 lb. ¶¶¶¶ 7½ x 7½ x 12. ‡‡‡‡‡ Speed tile. §§§§§ F.o.b. Buffalo. ¶¶¶¶¶ Truck lots. ‡‡‡‡‡‡ Provincial and Municipal tax extra. §§§§§§ Not used because of earthquake danger. ¶¶¶¶¶¶ 2% discount for cash.

a 5¼ x 8 x 12. b Tax exempt. c Sand lime. d 5 x 8 x 12. e Stabilized. f Pebble lime price per 80 lb. sack. g Price per sack. Lime not sold per ton. h F.o.b. plant. i Truck delivery. j 6 x 12 x 12. k Pebble lime. l 80% common. m Select. n F.o.b. plant. * All load-bearing, nonload-bearing no longer mf'd in Detroit.

PAINT, ROOFING—F.O.B. CARLOAD LOTS

	RED LEAD	WHITE LEAD	READY-MIXED PAINT				ROOFING SUPPLIES, Carload lots f.o.b. factory				
	Per 100 lb. in 600-lb. (Approx.) bbl. Dry a	Per 100 lb. in 100 lb. cases In oil a	Per gal., drums Graphite b	Aluminum c	Ferric Oxide d	Rolls, mfr. surfaced, 55 lb. per sq.	Asphalt felt, per 100 lb.	Tar felt, per 100 lb.	Asphalt coating, per gal.	Tar pitch, 390 lb. bbl. per ton
Atlanta	$15.75	$20.375	$1.75	$2.70	$1.65	$2.00‡	$2.00‡	$2.06‡	$1.00‡	$36.00‡
Baltimore	15.50	20.00	2.10	4.27	2.00	2.06	3.04	3.04	.55	36.00
Birmingham	15.75	20.375	3.00	3.40		2.80	2.75	2.75		40.50ee
Boston	15.50	20.00				2.68‡		2.67‡y	.36	34.00
Chicago	15.50	20.00				2.34‡n	2.54‡o	2.54‡o	.34.00‡bb	37.00‡
Cincinnati	15.50	20.00	2.00	2.00		2.44‡	2.54‡o	2.54‡o	.35y‡	40.80‡
Cleveland	15.50	20.00	2.50ppp	2.75ppp	2.35	2.50	2.50	2.50	.30y	31.00
Dallas	15.75	20.75		4.05		3.50z	3.75o	4.35o	.36	46.00
Denver	16.00	20.50	2.63	4.38	2.48	3.20n	2.20o	2.20o	.41y	40.00
Detroit	15.50	20.00	2.35	3.30	2.50	2.20	2.20‡	2.20‡	.41S	35.00
Kansas City	15.50	20.12								
Los Angeles	15.50	20.25	2.80	3.75	3.80	2.35	1.75ee	t	.36	t
Minneapolis	15.50	20.12.25.55				2.09‡dd	2.18‡ddd	2.18‡ddd	.336‡dd	34.00e
Montreal		22.00	3.75‡	4.20‡	3.62‡	3.25‡	3.00‡f	3.00‡f	.75‡f	2.60‡f
New York	15.50	20.00	3.40p			2.32	2.41o	2.41o	.34u	35.00
Philadelphia	15.50	20.00	3.25	3.65	3.15	2.54	2.94	2.94	.37	26.00
Pittsburgh	15.50	20.00	2.00	2.00	1.90	2.75	2.75o	2.75o	.37	38.00
St. Louis	15.50	20.00				2.84	2.54h	2.54h	.39	37.00
San Francisco	15.50	20.25	1.80	2.75n	1.35	2.27	3.00‡z		.38q	
Seattle	15.50	20.50	2.50m	2.97m		3.23‡mee	2.71‡mee		.50mee	48.75‡mc

‡ Delivered. Note: Red lead in oil 50c higher than white lead in oil. a Red lead prices change frequently due to pig lead price changes. b U. S. War Dept. Spec. 3-49A. c ASTM Spec. D266-31. d 80% minimum ferric oxide. e 15 lb. f Per 432 sq. ft. g Per roll. 65 lb. h Net carload lot prices, Minneapolis and vicinity. i Asphalt pitch. j Per cwt. k Not used. m 1% discount for cash. n May 1941 price. o Per 100 sq. ft. roofing package. p F.o.b. factory. q Per 400-lb. roll. r F.o.b. factory Chicago. s ASTM Spec. D200-41. t Federal tax included. u Per 100 sq. ft. v Per ton. w Price to large paint contractors is $1.25 less. x Mineral surfaced. y 55-gallon container. z Drums. aa Approximate cost per 100 lbs. bb Roofers coating and cement. cc Price per ton. dd L.C.L. truck delivery. ee 4.2% cash discount. ff Asphalt, in 100 lb. package. gg 5-gal. drums. hh F.o.b. factory.

SKILLED AND COMMON WAGE RATES—PER HOUR

	Bricklayers	Carpenters	Struct. Iron Workers	Hoisting Engineers	Plasterers	Electrical Workers	Steamfitters	Common Labor Building	Common Labor Heavy Const.
Atlanta	$2.50	$1.85	$2.125	$2.00	$2.25	$2.25	$2.00	$0.90	$0.95
Baltimore	3.00	2.35	2.65	2.50-2.80	2.50	2.40	2.40	1.35	1.35
Birmingham	2.50	1.90	2.20	1.875	2.20	2.35	2.25	1.00	1.10
Boston	2.775	2.25	2.55	2.60	2.70	2.50	2.45	1.75	1.75
Chicago	2.925a	2.75b-m	2.90	2.50	2.55	2.525	2.45	1.80a	1.80a
Cincinnati	2.575	2.25	2.425	2.375	2.425	2.45	2.40	1.535	1.535
Cleveland	2.50	2.50d	2.50	2.50	2.50	2.50	2.50	1.675	1.65
Dallas	2.500	2.125	2.25	2.25	2.500	2.375	2.375	1.025	1.275-1.50
Denver	3.00	2.10	2.10	2.25	2.50	2.45	2.40	1.40	1.45
Detroit	2.75	2.50	2.50	2.50	2.562	2.55	2.525	1.80	1.80
Kansas City	2.50	2.20	2.35	2.45	2.50	2.475	2.53	1.625	1.625
Los Angeles	2.75	2.12	2.38	2.07	2.125	2.50	2.50	1.57	1.57
Minneapolis	2.40	2.12	2.275	2.07	2.50	2.35	2.42	1.52	1.52
New Orleans	2.50	1.975	2.35	2.225	2.275	2.45	2.35	1.10	1.10
New York	3.20	2.750	3.00	3.00	3.200	3.00a	2.750	1.70	1.70
Philadelphia	3.30	2.525	2.850	2.50	3.075d	2.575-3.125	2.575-3.125	1.475	1.575
Pittsburgh	3.00	2.65	2.625	2.65	2.825	2.575	2.80	1.50	1.50
St. Louis	2.833e	2.458	2.50	2.55	2.75	2.50	2.50	1.65	1.60-1.75
San Francisco	3.00d	2.225	2.50	2.19	3.00	2.50	2.50	1.55	1.55
Seattle	3.00	2.100	2.395	2.10	2.695	2.395	2.50	1.795	1.80
Montreal*	1.40	1.25	1.25	1.20	1.40	1.35	1.35	.90	.80

a 6 hr. day. b 7 hr. day. c Incl. 3% vacation stamps fund for bricklayers, 2% for electricians. * Cost of living bonus now included in base wage. † Includes 5c per hr. for industrial fund. d $1.00 daily bonus. e $2.20 bonus and hoisting. f 2c vacation fund. g Incl. 2c welfare. h Incl. 5c hr. welfare. i Incl. 2½ c hr. welfare fund. j Incl. 1c vacation fund. k Incl. 5c hr. welfare fund.

MEXICO CITY PRICES

In Pesos, F.o.b. City		Apr. '50	May '50
Common Wages—Building (8 hr. day)	av. per hr.	.53	.53
Common Wages—Heavy Const. (8 hr. day)	av. per hr.	.69	.69
Skilled Labor Wages:			
Carpenters (8 hr. day)	av. per hr.	1.88	1.88
Bricklayers (8 hr. day)	av. per hr.	1.50	1.50
Struct. Iron Workers (8 hr. day)	av. per hr.	1.50	1.50
Struct. Steel Shapes 3" 15" x 12 meters	per ton	925.25	925.25
Reinf. Steel, Corr. Rods ⅜" x 11 meters	per ton	1,075.00	1,010.00
½" x 11 meters	per ton	1,005.00	1,040.00
⅝" x 11 meters	per ton	1,035.00	990.00
¾" x 11 meters	per ton	1,035.00	990.00
⅞" x 11 meters	per ton	1,145.00	1,090.00
1" x 11 meters	per ton	1,145.00	1,090.00
Gravel, trips load of 3½ cu. meters Blue Gravel	per tr. load	.52.00	.52.00
Rose Gravel	per tr. load	.30.00	.30.00
Cement, Std. Port. (Tolteca)	per ton	115.00	115.00
Lumber Mex. Sacred Fir (Oyamel)	per M ft.	400.00	400.00
1st Class Pine	per M ft.	750.00	750.00
2nd Class Pine	per M ft.	650.00	650.00

ENR Skilled Average: Bricklayers, Carpenters, Iron workers: $2.517. **ENR Common Average:** $1.528.

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TRUSCON STEEL COMPANY
Subsidiary of Republic Steel Corporation
YOUNGSTOWN 1, OHIO
Warehouses and sales offices in principal cities

Construction view, State Office Building, Jackson, Miss. Architects: E. L. Mulvaney & Assoc. Structural engineer: Hurry Howe. Contractor: T. A. Jones Construction Company.

Quality Construction at substantial savings with CONCRETE FRAMES AND FLOORS

REINFORCED concrete frame and floor construction offers both high quality and economy. A typical example is the State Office Building in Jackson, Miss. illustrated above, where it was considered the most economical high-grade construction for a building of this type and size.

Cost analyses and competitive bids throughout the nation show that savings up to 40% are made with reinforced concrete frames and floors.

Substantial savings in time result too. Frame and floor construction proceed simultaneously. Thus masons, plumbers, electricians and other tradesmen can do their jobs while the structural work progresses. Such construction meets all the requirements for flexibility in conduit layout.

Slab band floor construction, which was used in the State Office Building in Jackson, also permits a reduction in total building height. This saving is due to the elimination of the headroom required by conventional beams and girders in other types of construction.

Architects and structural engineers like the wide latitude and flexibility they have in locating partitions with slab band floors. The result is efficient use of total floor area.

Should you desire help in attaining quality concrete or the maximum structural advantages of reinforced concrete construction on any project our technical staff will be glad to assist you.

If you want more information about reinforced concrete frame and floor construction write for two free booklets: "*Continuity in Concrete Building Frames*," and "*Handbook of Frame Constants*," distributed only in the U. S. and Canada.

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CONSTRUCTION REPORTS–Second Section

WATER SUPPLY

BIDS ASKED

Md., Hyattsville—B. A. e 14—Washington Suburban Sanitary Comm., 4017 Hamilton St. Consulting Engr. Lindenberg & Page Clear Well cement work

† Mississippi—B. A. e 14—U. S. Eng. P. O. Box 93, Memphis, Tenn. relief wells and counterweight work

† R. I. Providence—B. A. e 14—Water Supply Bd., 552 Westminster St. Engr. N. Y. Water Service Corp., 67 Wall St., N. Y. C. Improvements to water supply system, incl. intercepting water mains at S. Main St. and Manton Ave., pumping station, reservoir, tunnel

Ky., Morehead—B. A. e 15—City Council. Improvements to city water system, incl. water receiving reservoir, water supply mains and appurtenant work. Engr. The Sheffler Engineers, 220 E. Parkway, Pittsburgh. Bond $5,000

O., Dayton—B. A. e 15—Comm. Montgomery Co. Courthouse, Dayton. Engr. Morgan Engineering Co., Union Trust Bldg., Cincinnati

† Mississippi—B. A. e 14—National Park Service, Interior Dept., Washington, D. C. Improvements to water supply system at Natchez Trace Parkway, Area 1, incl. water mains, pumping equipment and appurtenant work. Engr. Natchez Trace Parkway, Area 1, Natchez, Miss.

Wis., Cudahy—B. A. e 15—City Council. Improvements to water supply system, incl. 1,000,000-gal. elevated steel tank, 12-in. water mains, booster pumping station and appurtenant work. Engr. Bonestroo, Rosene & Anderlik, 2335 Hamline Ave., St. Paul, Minn.

† N. M., Albuquerque—B. A. Apr. 14—U. S. Eng. Office, Albuquerque. Improvements to water supply system at Kirtland Field, incl. 1,000,000-gal. elevated steel tank, 12-in. water mains, booster pumping station and appurtenant work. Engr. Bonestroo, Rosene & Anderlik, 2335 Hamline Ave., St. Paul, Minn.

Tex., Houston—B. A. Apr. 21—Water Purification Plant Bd., 410 Bagby St. Improvements to water supply system, incl. 2,000,000-gal. elevated steel tank, 12-in. water mains, booster pumping station and appurtenant work. Engr. Bonestroo, Rosene & Anderlik, 2335 Hamline Ave., St. Paul, Minn.

LOW BIDDERS

▲ Pa., Allentown—City Council, 626 Linden St. Improvements to water supply system, incl. 2,000,000-gal. elevated steel tank, 12-in. water mains, booster pumping station and appurtenant work. Engr. Bonestroo, Rosene & Anderlik, 2335 Market St., Camden, N. J. $1,871,600. Contr. Erecting and engineering work by Pittsburgh Des Moines Steel Co., Pittsburgh. $386,625. Bids A 25, awarded $16; CD 5-8, under 18

SEWERS, WASTE DISPOSAL

BIDS ASKED

Ky., Morehead—B. A. e 15—City Council. Improvements to city sewer system, incl. sewage treatment plant, sewer connections, lateral sewers, extensions of existing sewers, lateral sewers, appurtenances. Cost $300,000. Engr. The Sheffler Engineers, 220 E. Parkway, Pittsburgh. Bond $5,000

Mass., Boston—B. A. e 15—Commonwealth of Mass., Metropolitan Sewerage Bd., 20 Somerset St. Improvements to Metropolitan sewerage system, incl. 2 sewage pumping stations, 2 force mains, 2 gravity sewers and appurtenant work in Weymouth, Braintree and North Weymouth. Engr. Metropolitan Sewerage Bd., 20 Somerset St., Boston. Plans deposit $25

N. Y., Rochester—B. A. e 15—Comm. of Public Works, City Hall. Improvements to sewage treatment plant, incl. sewers, pumping station, force mains and appurtenant work. Engr. Comm. of Public Works, City Hall. Plans deposit $10

Mass., Dudley—B. A. e 17—Town Clerk. Improvements to sewer system, incl. 3,110,000-gal. Imhoff tank, 4,000 lin. ft. 8-in. sewer, 1,000 lin. ft. 10-in. sewer, 1,000 lin. ft. 12-in. sewer, 1,000 lin. ft. 15-in. sewer, 1,000 lin. ft. 18-in. sewer, 1,000 lin. ft. 24-in. sewer, 1,000 lin. ft. 30-in. sewer, 1,000 lin. ft. 36-in. sewer, 1,000 lin. ft. 42-in. sewer, 1,000 lin. ft. 48-in. sewer, 1,000 lin. ft. 54-in. sewer, 1,000 lin. ft. 60-in. sewer, 1,000 lin. ft.

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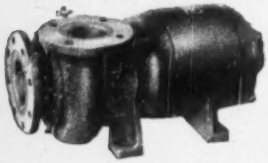

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† N. D., Fargo—B.A. 6/27—Veterans Admin., Municipals Bldg., Wash. 25, D. C., roads, walks, parking area for Veterans Admin. Center, Spec. 5099, Proj. No. 6-4230.

Tex., San Antonio—Bids Asked—John P. Pfeffer & Assoc., K-S Security Title Co., South Texas Bldg., street constr. and paving, 114 acre tract off Culebra Rd. and Hillcrest Dr., $75,000.

LOW BIDDERS

▲ Pennsylvania—State Hy. and Bridges Auth., Harrisburg, May 26, construct divided highway consisting of reinforced concrete pavement 24 ft. wide on each side of an earth or concrete divider and the construction of reinforced concrete pavement, variable width 44 to 52 ft. for the construction of reinforced concrete pavement, variable width 44 to 52 ft. for the construction of reinforced concrete pavement, variable width 44 to 52 ft. for

MORE YARDAGE LESS LABOR LARGER PROFITS

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Sauerman Slackline Cableway pictured above digs gravel from lake and keeps screening plant supplied with 75 cu. yd. an hour at cost of only a few cents per yard. The Sauerman machine digs, lifts, conveys and dumps in a steady, rapid cycle and one man handles the entire operations. It beats all other methods on work of this kind.

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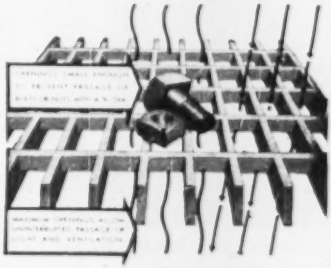

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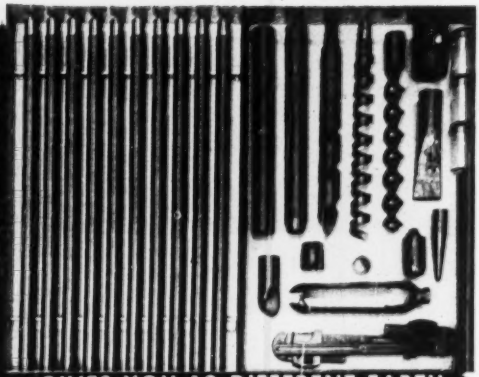

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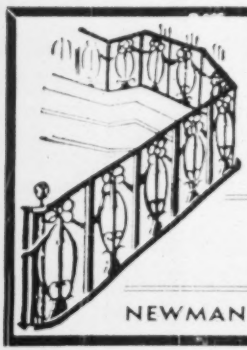

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(Continued on page 103)

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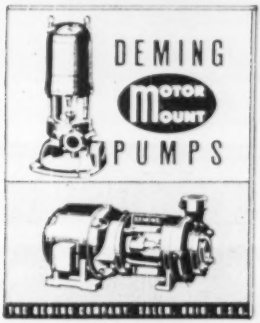

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(Continued from page 101)

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▲ Pa., Farrington ... $1,011,490

▲ Mo., St. Louis ... $7,500,000

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▲ Wis., Hayertown ... $1,500,000

▲ Mass., Taunton ... $5,349,933

▲ O., Cambridge ... $1,251,366

▲ O., Hamilton ... $1,228,875

▲ R. I., Exeter ... $744,950

▲ Wash., Pullma ... $283,388

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▲ Pa., Harrisburg ...

▲ Tex., Dallas ...

▲ Ill., Chicago ...

SOON LETS CONTRACT

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▲ Wis., Milwaukee ...

LOW BIDDERS

▲ R. I., Providence ... $1,334,000

CONTRACTS AWARDED

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▲ Calif., Clearwater ...

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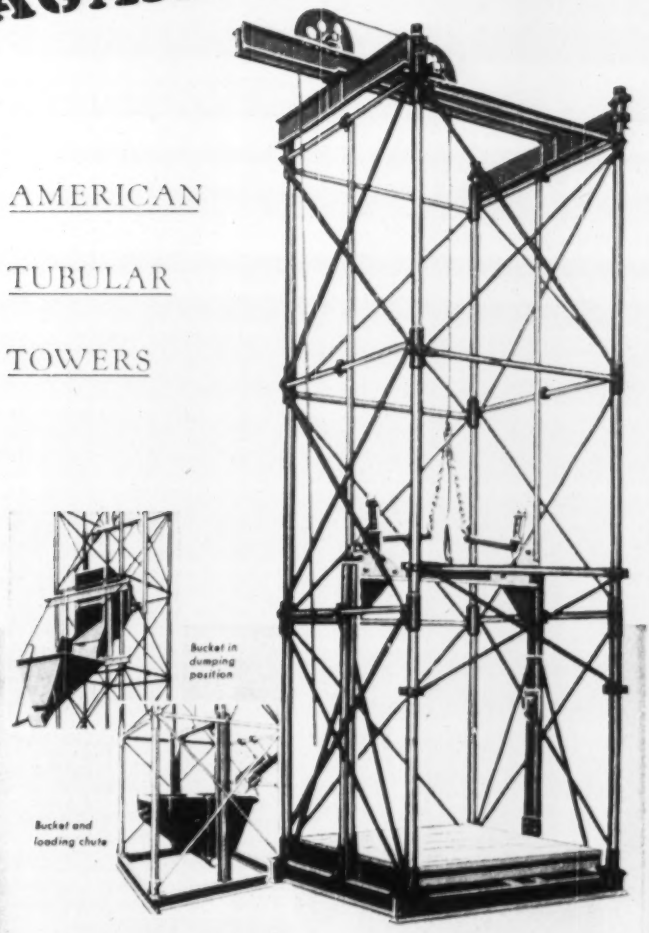

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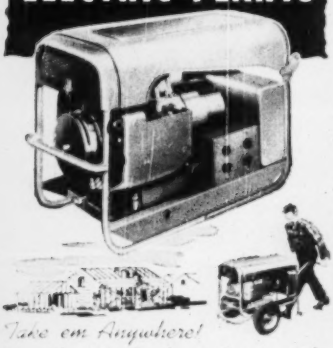

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DIAMOND AND SHOT CORE BORINGS—DRY SAMPLE BORINGS

Foundation Testing for Bridges, Dams and all Heavy Structures

Also

Manufacturers of Diamond and Shot Core Drills, Accessories and Equipment

SPRAGUE & HENWOOD, Inc.
Scranton, Pa. Dept. E, U. S. A.

CONTRACTORS' FIELD OFFICE TRAILER

Designed by Road Contractor

26' Aluminum Body—8' Wide
2 Rooms—2 Built in Desks
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Letter Files—Cabinets—
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Price $2600.00 f.o.b. Baltimore

TRAILER VILLAGE, INC.
3645 Pulaski Highway, Baltimore 21, Md.
Phone: Essex 2233

Assoc., 6338 Wilshire Blvd., Los Angeles. Approx. $2,649,000.

▲ Calif., Los Angeles—DWELLINGS—Clairmont Co., 324 Highland Ave., 226 frame, stucco dwellings to Harper Constr. Co., 744 N. Highland St., $1,808,000. Herman C. Light, 7551 Melrose Ave., archt.

▲ Calif., Los Angeles—STORE—Sears, Roebuck & Co., 2650 S. Olympic Blvd., 2 story, 151,432 sq. ft. brick concrete store to Haddock Eng. Ltd., 1616 S. Green-wood Ave., Montebello, $1,400,081. Bids: 2-26-50. CD 3-8-50, under LB.

▲ Conn., Derby—HOUSING—Harold B. Yoder, Seldom Lane, 256 single frame houses, Seldom Lane, Owner builder, $2,500,000. CD 5-24.

▲ Ill., River Forest—CLASSROOMS, etc.—Rosary College, 7900 Division St., 4 story, 50,000 sq. ft. classroom and auditorium to W. E. Lynch Co., 75 N. State Sts., Chicago, Zone 2, $1,200,000. Awarded 5-1-50. Hare & Hare, 667 Lk. Sh. Dr., Chicago, Zone 11, archts. (J. L. Mackenzie & Assoc., 53 W. Jackson St., Chicago, Zone 4, engr.). CD 4-20-50.

▲ Ky., Louisville—HOUSING—Preston Corp., c/o David H. Wilson, pres., 1926 S. 3rd St., 325 home subdivision on 126 acre tract, incl. 5 acre shopping and parking center, separate contracts, $2,000,000.

▲ Okla., Fort Sill—HOUSING—Fourth Army, headquarters, Fort Sam Houston, Tex., construct, manage and finance 500 unit housing to Hub H. & R. Assoc., Andrews Bldg., Dallas, Tex. Approx. $5,000,000. construction to J. W. Bateson Constr. Co., Irwin-Keasler Bldg., Dallas, Tex. Awarded 5-24. Jones, Layland, Kell, P. Anderson Bldg., Fort Worth, Tex., archts. CD 4-19, under LB.

▲ Ore., Portland—APARTMENT—Vista View Co., Commerce Bldg., construct 12 story Vista St. Court apartment at 22 and Vista Aves. and Park St. and Main St. to Smith Phillips, Board Trade Bldg., $2,977,160. Awarded 5-24. Victor N. Jones, Republic Bldg., Seattle, Wash., archt.

▲ Ont., Ottawa—APARTMENT BLOCKS—Alvin Enterprises Ltd., 3009 Sherbrooke St. W., Montreal, Que., twenty-nine 2 story, 28x120' ft. sixteen 2 story, 50x39 ft., six 2 story, 28x72 ft., 4 concrete brick veneer apartment blocks, Manor Park Extension, 28 blocks (Donola, Inc., 4330 St. Lawrence Blvd., Montreal, Que., Approx. $2,000,000.

INDUSTRIAL BUILDINGS

BIDS ASKED

Ill., Chicago—WAREHOUSE—Bids Asked—R. Cooper Jr. Co., 4416 W. 47 St., Zone 32, 1 story, brick, steel & concrete warehouse, for General Electric Co., Edwin S. Lukes Shore Dr., $500,000. A. Epstein & Sons, Inc., 160 N. Wells St., Zone 6, archts.

O., Youngstown—WAREHOUSE—Bids Asked—Truscon Steel Co., 1335 Albert St. extens., 1 story, 100,000 sq. ft. steel storage warehouse for steel, bldg. materials, materials fabricated in Truscon plant with brick facing in Willow St. south of Truscon main plant, $300,000.

Wis., King—BOILER PLANT—Bids Asked—Wisconsin Grad Army, home for Veterans, King, boiler plant, $500,000. Hostley & Childs, 231 S. LaSalle St., archts.

CONTRACTS AWARDED

▲ Ill., Chicago—U. S. TERMINAL—Greenwood Corp., 1 W. Madison St., Zone 2, superstructure for terminal connecting through tunnels to lower level W. Walker Dr., to John W. Hines Assoc., 140 S. Dearborn St., Zone 3, and substructure to Hensley-Schmidt, Inc., 79 W. Monroe St., Zone 3, $2,000,000. S. Sklarsky & Assoc., 100 W. Monroe St., Zone 3, archts. CD 11-1-49.

UNCLASSIFIED

CONTRACTS AWARDED

▲ Mass., Boston—PIERS—Port of Boston Auth., Commonwealth Pier 5, South Boston Marine Terminal, pier facilities, Pier 5A, and for Industrial Terminal Road to Marginal Channel A, 243 Regent Ave., West Lynn, Conn., $3,472,117. Bids 4-26-50. CD 3-8-50, under LB.

▲ N. C., Wilmington—WHARF, etc.—South Carolina Ports Auth., Wilmington, to rebuild wharf, 400' x 70' to Diamond Shoals Oil, and to Sts. S. F. Wash., D. C., $1,901,369. Bids 4-19, awarded 5-23. CD 2-22, under LB.

▲ Texas—RAILWAY LINE—Gulf, Colorado & Santa Fe Ry. Co., W. T. Brooks, agt. or engr., Santa Fe Bldg., Galveston, May 20, construct 1.5 mi. standard gauge railway line between Rogers and Temple, Bell County, to Austin Bridge Co., Dallas, $1,288,000. CD 4-27-50.

▲† Virginia—PIER REPAIRS and RAILROAD—U. S. Engineer, Post of Fleet P. O., Norfolk, warehouse and railroad repairs to Pier 5, Sewells Point, Norfolk Co., to Cox Construction Co., 126 Granby St., Norfolk, $4,157,991. Bids 4-27. CD 4-5, under LB.

▲ Ont., Toronto—SUBWAY—Toronto Transportation Comm., 36 Adelaide St. E., subway at Yonge Street between Queen St. Richmond St. and Adelaide St. Queen St. Subway Approx. $7,000,000. Bids 6-6.

Proposal Advertisements see pp. 105 to 109

U. S. Government

Department of the Interior, Bureau of Public Roads, May 26, 1950. SEALED BIDS will be received at the office of the Bureau of Public Roads, c/o Acadia National Park, Post Office, Bar Harbor, Maine, until 10:00 a.m., E.S.T., JUNE 20, 1950, for the construction of Project 104, Acadia National Park, Hancock County, Maine, Reinforced Concrete Bridge with Stone Facing and Approaching Roadway, 0.284 mile, on the one-way loop section of the park highway. Estimated quantities of the major items of work are as follows: 1,000 cu. yd. Excavation, 1,200 cu. yd. Gravel Compacted Surface, Reinforcing Steel and 1,946 cu. yd. Stone Masonry. Minimum wage rates have been fixed as required by law. Forms and specifications, a deposit of $10.00 (by certified check made payable to the Treasurer of the United States) will be required to insure their return within 15 days after the opening of bids. Plans, specifications and proposal forms may be obtained from the Bureau of Public Roads office, c/o Acadia National Park Office, Bar Harbor, Maine, or 1104 Columbia Pike, Arlington, Virginia. H. J. Spelman, District Engineer. (S12)

OFFICIAL PROPOSALS

Bids: June 12, 1950 (S11)

Furnishing and Delivering Cast Iron Soil Pipe and Fittings

WASHINGTON SUBURBAN SANITARY COMMISSION

SEALED PROPOSALS

Sealed proposals for furnishing and delivering thirty thousand (30,000) L.F. (more or less) of 4" cast iron soil pipe, seven hundred (700) L.F. (more or less) of 6" cast iron soil pipe, one hundred fifty (150) L.F. (more or less) of 8" cast iron soil pipe, one hundred (100) L.F. (more or less) of 10" cast iron soil pipe, all to be furnished in accordance with Washington Suburban Sanitary Commission Specifications, Hyattsville, Maryland, until Monday, June 12th, 1950 at 10:00 A.M. Eastern Daylight Saving Time, at which time and place they will be publicly opened and read.

Specifications may be obtained from W. B. Douglas, Purchasing Agent of the Commission, Hyattsville, Maryland.

Dwight B. Gall, Chairman
Warren Brewer
Leland G. Worthington
Commissioners

Bids: June 27, 1950 (S10)

Elementary School

Contract No. E50-26

Sealed proposals will be received at the office of the Purchasing Agent, City of Hartford, Municipal Building, 550 Main Street, until 2 p.m. D.S.T., June 27, 1950 for

Construction of an elementary school, to be known as the Mary M. Hooker School, at Sheffield Avenue.

The bidder must file with his bid a certified check or bid bond for 10% of the total bid price made payable to the City Treasurer of Hartford.

A satisfactory performance bond for 100% of the contract price will be required of the successful bidder.

Plans, specifications and blank forms of proposal may be obtained at the City Engineer's office, Municipal Building, upon deposit of $5.00 which will be refunded to the bidder who has submitted a bid and has returned the plans in good condition within ten days after the opening of bids. A bidder who has not submitted a bid but has returned the plans in good condition

No bid may be withdrawn for a period of 30 days after the opening of bids without the approval and written consent of the City Manager.

The right is reserved to reject any and all bids not deemed to be the best interest of the City.

CITY OF HARTFORD
BY N. B. Heiser
PURCHASING AGENT

OFFICIAL PROPOSALS

Bids: June 26, 1950 (S02)

Golf-Course Restaurant

THE PORT OF NEW YORK AUTHORITY
NEWARK AIRPORT

CONTRACT NA-25

Sealed proposals for the construction of the golf-course restaurant at Newark Airport will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 8th Ave., New York, N. Y., until 11:30 A.M. Monday, June 26, 1950, at which time and place said proposals will be opened and read.

Contract documents may be seen at the office of the Chief Engineer and copies will be furnished upon deposit of $10 per set. The deposit will be refunded if the documents are returned in good condition not later than ten days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
Howard S. Cullman, Chairman

New York, June 5, 1950

Bids: June 19, 1950 (S00)

Access Road to Golf Course

THE PORT OF NEW YORK AUTHORITY
NEWARK AIRPORT

CONTRACT NA-25

Sealed proposals for the construction of an access road to the golf course at Newark Airport will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 8th Ave., New York, N. Y., until 11:30 A.M. Monday, June 19, 1950, at which time and place said proposals will be opened and read.

Contract documents may be seen at the office of the Chief Engineer and copies will be furnished upon deposit of $10 per set. The deposit will be refunded if the documents are returned in good condition not later than ten days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
Howard S. Cullman, Chairman

New York, June 5, 1950

Runway

Government of the Union of Burma proposes to build a new runway at Mingaladon Airport, Rangoon and requests reputable firms of construction engineers to submit proposals on the following specifications:

Two dimensions of runway are nine feet x 200 feet with parallel taxitrack width 50 feet.

Three aircraft parking apron 600 feet x 300 feet four runway, taxitrack and apron to be stressed to take aircraft of 180,000 lbs weight all up weight.

The runway to be of concrete construction, asphalt covered.

Firms of construction engineers who are interested in the above project are requested to send representatives to Rangoon to view the site, to submit design specifications and draft agreements for the construction on a cost plus basis of contract. Firms proposing to send representatives are requested to do so at their own expense. The Director of Civil Aviation, Rangoon, Burma stating date their representatives will arrive. All offers to be filed with Director of Civil Aviation within 30 days of the date of this advertisement.

Burmese Embassy
(S03)

Bids: June 19, 1950 (S05)

Borings for Connections to New Jersey Turnpike

THE PORT OF NEW YORK AUTHORITY
LINCOLN TUNNEL—NEW JERSEY APPROACH

CONTRACT LT-51

Sealed proposals for making borings over or near the center line of the New Jersey approach to the Lincoln Tunnel will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 8th Ave., New York, N. Y., until 11:30 A.M. Monday, June 19, 1950, at which time and place said proposals will be opened and read.

Contract documents may be seen at the office of the Chief Engineer and copies will be furnished upon deposit of $10 per set. The deposit will be refunded if the documents are returned in good condition not later than 30 days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
Howard S. Cullman, Chairman

New York, June 5, 1950

OFFICIAL PROPOSALS

Substructure

Sealed proposals will be publicly opened and read by the Jones Beach State Parkway Authority at Administration Headquarters, Field No. 6, Jones Beach State Park, Babylon, New York, on Friday, June 16, 1950 at 2:00 P.M. Eastern Daylight Saving Time, for furnishing the necessary labor, material and equipment for and incidental to Contract No. 2, construction of the substructure of the proposed Captree State Causeway bridge and approaches across Great South Bay east of Babylon, Long Island and the appurtenances of the proposed traffic bridge across the State Boat Channel at Captree Island, Suffolk County, New York, as shown on the Plans and in accordance with the Contract, Special Conditions and Specifications and as directed by the Engineer.

Bid Work will be let in one (1) part of the lump sum bid, which shall be the amount of the summation of the products of the quantities multiplied by the unit price bid.

Proposal forms, specifications and plans may be seen and obtained at the office of the Jones Beach State Parkway Authority, Administration Headquarters, Field No. 6, Jones Beach State Park, Babylon, New York and at the office of Hardesty & Hanover, Consulting Engineers, 101 Park Avenue, New York, New York City. A certified check for approximately 10 percent of the bid in each accordance with a schedule given in the specifications, must accompany each bid.

One (1) set of plans and Proposal forms will be required. No refund will be made for the return of the plans.

The Jones Beach State Parkway Authority reserves the right to reject any or all bids. Contractors wishing to examine the site of the proposed work may obtain the services of a boat free of cost by getting in touch with the Engineering Department of Long Island State Park Commission, telephone Babylon 1000.

Bids: June 14, 1950 (S26)

Furnishing and Delivering 24" Cast Iron Pipe

WASHINGTON SUBURBAN SANITARY COMMISSION

SEALED PROPOSAL

Sealed proposals for furnishing and delivering three hundred (300) L.F. (more or less) of 24-inch cast iron pipe, Class Cas Special Thickness will be received in the office of the Purchasing Agent, Room 204, Hamilton Street, Hyattsville, Maryland, until 10:00 A.M. Eastern Daylight Saving Time, Wednesday, June 14, 1950, at which time and place they will be publicly opened and read.

Specifications may be obtained from W. B. Douglas, Purchasing Agent of the Commission, Hyattsville, Maryland.

Dwight B. Gall, Chairman
Warren Brewer
Leland G. Worthington
Commissioners

(Continued on page 106)

CONTRACTORS WATCH THIS SECTION

for New Projects

Publish your announcements thru the "Proposal Section" of Engineering News-Record and get their bids.

U. S. Government
(Continued from page 105)

UNITED STATES DEPARTMENT OF THE INTERIOR, Bureau of Reclamation, Sealed bids (Specifications No. 3660) will be received by Bureau of Reclamation, Ephrata, Washington, June 22, 1950, and then publicly opened for furnishing labor and material and performing all work for the construction of earthwork, asphaltic concrete lining, pipe lines, and structures in W-3 laterals and sublaterals and sublaterals, lateral W-22, Station 1+37.22 to Station 114+70 and sublateral W-21E, Station 0+00 to Station 55+55.5, West Canal laterals, Columbia Basin Project, Washington. The work is situated about 2 miles southeast of Ephrata, Washington. Principal items are approximately: Excavation, 10,000 cu yds; asphalt for membrane lining, 700 tons; concrete, 100 cu yds; gates and metalwork, 20,000 lbs; 13,000 lin ft of 36-in and smaller diameter concrete pipe of various types; all concrete for siphon and other work. Time allowed for completion will be 100 days. For particulars address Bureau of Reclamation, Ephrata, Washington, or Room 1-A, Denver Federal Center, Denver, Colorado.

MICHAEL W. STRAUS, Commissioner.
(4803)

Office of the District Engineer, Corps of Engineers, U. S. Army, 1217 U. S. Post Office and Custom House, St. Paul 1, Minnesota, sealed bids in duplicate for furnishing all labor and material and performing all work required for Channel Improvement in Wild Rice River, Minnesota, will be received in this office until 11:00 A.M., C.S.T., June 15, 1950 and then publicly opened. Further information upon application.

(4788)

UNITED STATES DEPARTMENT OF THE INTERIOR, Bureau of Reclamation, sealed bids (Specifications No. 3670) will be received by Bureau of Reclamation, Rock Springs, Wyoming, June 27, 1950 and then publicly opened for furnishing labor and materials and performing all work for construction of the Smith Draw and Dee Pipe Project, Wyoming. The work is situated in the Big Sandy creek about 15 miles south of Eden, Wyoming. Principal items are approximately: excavation, 1,020,000 cu yds; fill, 182,000 cu yds; riprap, 12,500 cu yds; concrete lining, sewer pipe, and the like; concrete lining, sewer pipe, and the like; corrugated metal pipe, 12,500 lin ft; concrete lining, sewer pipe, and the like; concrete lining, sewer pipe, and the like; concrete lining, sewer pipe, and the like

OFFICIAL PROPOSALS

(Continued from page 106)

Bids: June 22, 1950 (779)

Water Distribution & Sanitary Sewerage System & Plant

Sealed proposals will be received by the Hummels Wharf Municipal Authority at Monroe Township Consolidated School, Hummels Wharf, Snyder County, Pennsylvania, until 8:00 o'clock P.M. (Eastern Daylight Saving Time) on Thursday, June 22, 1950 at which time and place the bids will be publicly opened and read aloud, for the Construction of Water Distribution System, Sanitary Sewerage System and Sewage Treatment Plant. Copies of the Plans, Specifications and other Contract Documents can be obtained from Richard J. Harman, Consulting Engineer, 222 North Third Street, Harrisburg, Pennsylvania, upon a deposit of $50.00 for each set of documents. If the documents are returned in good condition within five (5) days after the opening of the bids, one half amount ($15.00) of the deposit for one set will be refunded. If the documents are not returned within the time stated, the entire amount of the deposit will be forfeited. A certified check in the amount of $12,000.00 must be submitted with the proposal as bid security. No bid may be withdrawn for thirty (30) days after the scheduled closing time for receipt of bids.

The Hummels Wharf Municipal Authority of Hummels Wharf, Pennsylvania reserves the right to waive any informalities in or reject any or all bids.

Leon N. Messner, Secretary
Hummels Wharf Municipal Authority
Hummels Wharf, Pennsylvania

Bids: July 14, 1950 (778)

Plumbing

BETHLEHEM, PA.

NOTICE TO BIDDERS

Contract No. 3

Sealed proposals addressed to the Bethlehem Authority of the City of Bethlehem, Pa., for "Plumbing for Sewage Treatment Plant," will be received at the office of the Bethlehem Authority, 528 N. New St., Bethlehem, Pa. until 9:00 A.M., Eastern Standard Time on the 14th day of July, 1950. At which time and place they will be publicly opened and read.

Plans and specifications, form of contract and bidding blanks are on file and may be obtained at the office of the Bethlehem Authority, 528 N. New St., Bethlehem, Pa. for use in making up a bid by depositing $15.00 which amount will be refunded if a bid is submitted and the plans are returned in good condition. In case no bid is submitted, $10.00 will be refunded if said plans and specifications are returned in good condition within two weeks of the date set for the receiving of bids by the Authority.

No bidder will be permitted to withdraw his bid for a period of thirty (30) days after the date set for the opening of the bids.

The Bethlehem Authority reserves the right to waive any informality in any bid, to reject any or all proposals or to accept any bid deemed advisable for the best interests of the City of Bethlehem, Pennsylvania.

Each proposal shall be accompanied by a Certified Check, Bank Treasurer's Check or Cashier's Check, in an amount equal at least to five (5) per cent of the total of the bid submitted, drawn to the order of the Bethlehem Authority, Bethlehem, Pennsylvania. The bidder to whom a contract is awarded will be required to furnish, for the faithful performance of the work under this contract, an approved Surety Company Performance Bond in an amount equal to 50 per cent of the total of the bid submitted and a separate Surety Company Labor and Materialmen's Bond in an amount equal to 50 per cent of the total of the bid submitted.

Bethlehem Authority
Bethlehem, Pennsylvania
By: W. R. COYLE, CHAIRMAN
ROBERT L. FOX, Executive Director

OFFICIAL PROPOSALS

Bids: July 14, 1950 (777)

Heating and Ventilating

BETHLEHEM, PA.

NOTICE TO BIDDERS

Contract No. 4

Sealed proposals addressed to the Bethlehem Authority of the City of Bethlehem, Pa., for "Heating and Ventilating for Sewage Treatment Plant," will be received at the office of the Bethlehem Authority, 528 N. New St., Bethlehem, Pa. until 9:00 A.M. Eastern Standard Time on the 14th day of July, 1950. At which time and place they will be publicly opened and read.

Plans and specifications, form of contract and bidding blanks are on file and may be obtained at the office of the Bethlehem Authority, 528 N. New St., Bethlehem, Pa. for use in making up a bid by depositing $15.00 which amount will be refunded if a bid is submitted and the plans are returned in good condition. In case no bid is submitted, $10.00 will be refunded if said plans and specifications are returned in good condition within two weeks of the date set for the receiving of bids by the Authority.

No bidder will be permitted to withdraw his bid for a period of thirty (30) days after the date set for the opening of the bids.

The Bethlehem Authority reserves the right to waive any informality in any bid, to reject any or all proposals or to accept any bid deemed advisable for the best interests of the City of Bethlehem, Pennsylvania.

Each proposal shall be accompanied by a Certified Check, Bank Treasurer's Check or Cashier's Check, in an amount equal at least to five (5) per cent of the total of the bid submitted, drawn to the order of the Bethlehem Authority, Bethlehem, Pennsylvania. The bidder to whom a contract is awarded will be required to furnish, for the faithful performance of the work under this contract, an approved Surety Company Performance Bond in an amount equal to 100 per cent of the total of the bid submitted and a separate Surety Company Labor and Materialmen's Bond in an amount equal to 50 per cent of the total of the bid submitted.

Bethlehem Authority
Bethlehem, Pennsylvania
By: W. R. COYLE, CHAIRMAN
ROBERT L. FOX, Executive Director

Bids: July 15, 1950 (776)

Electric Power, Control and Lighting System

BETHLEHEM, PA.

NOTICE TO BIDDERS

Contract No. 2

Sealed proposals addressed to the Bethlehem Authority of the City of Bethlehem, Pa., for "Electric Power, Control and Lighting System" for Sewage Treatment Plant will be received at the office of the Bethlehem Authority, 528 N. New St., Bethlehem, Pa. until 9:00 A.M. Eastern Standard Time, on the 14th day of July, 1950. At which time and place they will be publicly opened and read.

Plans and specifications, form of contract and bidding blanks are on file and may be obtained at the office of the Bethlehem Authority, 528 N. New St., Bethlehem, Pa. for use in making up a bid by depositing $15.00 which amount will be refunded if a bid is submitted and the plans are returned in good condition. In case no bid is submitted, $10.00 will be refunded if said plans and specifications are returned in good condition within two weeks of the date set for the receiving of bids by the Authority.

No bidder will be permitted to withdraw his bid for a period of thirty (30) days after the date set for the opening of the bids.

The Bethlehem Authority reserves the right to waive any informality in any bid, to reject any or all proposals or to accept any bid deemed advisable for the best interests of the City of Bethlehem, Pennsylvania.

Each proposal shall be accompanied by a Certified Check, Bank Treasurer's Check or Cashier's Check, in an amount equal at least to five (5) per cent of the total of the bid submitted, drawn to the order of the Bethlehem Authority, Bethlehem, Pennsylvania. The bidder to whom a contract is awarded will be required to furnish, for the faithful performance of the work under this contract, an approved Surety Company Performance Bond in an amount equal to 100 per cent of the total of the bid submitted and a separate Surety Company Labor and Materialmen's Bond in an amount equal to 50 per cent of the total of the bid submitted.

Bethlehem Authority
Bethlehem, Pennsylvania
By: W. R. COYLE, CHAIRMAN
ROBERT L. FOX, Executive Director

OFFICIAL PROPOSALS

or Cashier's Check, in an amount equal at least to five (5) per cent of the total of the bid submitted, drawn to the order of the Bethlehem Authority, Bethlehem, Pennsylvania. The bidder to whom a contract is awarded will be required to furnish, for the faithful performance of the work under this contract, an approved Surety Company Performance Bond in an amount equal to 100 per cent of the total of the bid submitted and a separate Surety Company Labor and Materialmen's Bond in an amount equal to 50 per cent of the total of the bid submitted.

Bethlehem Authority
Bethlehem, Pennsylvania
By: W. R. COYLE, CHAIRMAN
ROBERT L. FOX, Executive Director

Bids: July 14, 1950 (775)

Pumping Equipment

BETHLEHEM, PA.

NOTICE TO BIDDERS

SEWAGE TREATMENT PLANT

CONTRACT NO. 2

Sealed proposals addressed to the Bethlehem Authority of the City of Bethlehem, Pa., for "Sewage Pumping Equipment and Appurtenances" for Sewage Treatment Plant, will be received at the office of the Bethlehem Authority, 528 N. New St., Bethlehem, Pa. until 9:00 A.M. Eastern Standard Time on the 14th day of July, 1950. At which time and place they will be publicly opened and read.

Plans and specifications, form of contract and bidding blanks are on file and may be obtained at the office of the Bethlehem Authority, 528 N. New St., Bethlehem, Pa. for use in making up a bid by depositing $15.00 which amount will be refunded if a bid is submitted and the plans are returned in good condition. In case no bid is submitted, $10.00 will be refunded if said plans and specifications are returned in good condition within two weeks of the date set for the receiving of bids by the Authority.

No bidder will be permitted to withdraw his bid for a period of thirty (30) days after the date set for the opening of the bids.

The Bethlehem Authority reserves the right to waive any informality in any bid, to reject any or all proposals or to accept any bid deemed advisable for the best interests of the City of Bethlehem, Pennsylvania.

Each proposal shall be accompanied by a Certified Check, Bank Treasurer's Check or Cashier's Check, in an amount equal at least to five (5) per cent of the total of the bid submitted, drawn to the order of the Bethlehem Authority, Bethlehem, Pennsylvania. The bidder to whom a contract is awarded will be required to furnish, for the faithful performance of the work under this contract, an approved Surety Company Performance Bond in an amount equal to 100 per cent of the total of the bid submitted and a separate Surety Company Labor and Materialmen's Bond in an amount equal to 50 per cent of the total of the bid submitted.

Bethlehem Authority
Bethlehem, Pennsylvania
By: W. R. COYLE, CHAIRMAN
ROBERT L. FOX, Executive Director

U. S. Government

NEW ORLEANS DISTRICT, Corps of Engineers, U. S. Army, 743 Customhouse, New Orleans, La., sealed bids will be received in the office of the District Engineer until 11 a.m., June 13, 1950, and then opened for the furnishing of superstructure of steel portion of Mississippi River Bridge, Huey P. Long Memorial Highway, Louisiana. The principal features of the work include the fabrication, erection and painting of approximately 6,000 tons of structural steel, and miscellaneous other work including concrete and rock fill, drainage system, and installation of 127 deck lights. Further information on application. (565)

(Continued on page 108)

OFFICIAL PROPOSALS
(Continued from page 107)

Bids: June 14, 1950 (7973)

Trunk Line Sewers

BETHLEHEM, PA.

Sealed proposals addressed to the Bethlehem Authority of the City of Bethlehem, Pa. for the construction of Trunk Line Sewer Section L, 2, 3, 4 and 5 will be received at the office of the Bethlehem Authority, 528 N. New St., Bethlehem, Pa., until 1:00 P.M. Eastern Standard Time, on the 14th day of July, 1950 at which time and place they will be publicly opened and read.

Plans and specifications, form of contract and bidding forms are on file and may be obtained at the office of the Bethlehem Authority, 528 N. New St., Bethlehem, Pa., for use in making up a bid by depositing $15 no part of which amount will be refunded if a bid is submitted and the plans are returned in good condition. In case no bid is submitted $10.00 will be refunded if said plans and specifications are returned in good condition within two weeks after the date set for the receiving of bids by the Authority.

No bidder will be permitted to withdraw his bid for a period of thirty (30) days after the date set for the opening of the bid.

The Bethlehem Authority reserves the right to award a separate contract on each Section, to waive any informality in any bid, to reject any or all proposals or to accept any bid deemed advisable for the best interests of the City of Bethlehem, Pennsylvania.

Each proposal shall be accompanied by a Certified check, Bank Treasurer's check, or Cashier's check, in an amount equal to at least 10% of the total of the bid submitted, drawn to the order of the Bethlehem Authority, Bethlehem, Pennsylvania. The bidder to whom a contract is awarded will be required to furnish, for the faithful performance of the work under this contract, an approved Surety Company Performance Bond in an amount equal to 100 percent of the total of the bid as submitted, and a like Surety Company Labor and Materialmen's Bond in an amount equal to 50 percent of the total of the bid submitted.

Approximate quantities
13,300 linear feet 45" to 66" sewer
11,400 linear feet 15" to 42" sewer
manholes
3 Inverted Siphons
4 Railroad Tunnels and appurtenances
Bethlehem Authority
Bethlehem, Pennsylvania
BY: W. R. Cook, Chairman
Robert L. Fox
Executive Director

Bids: June 27, 1950 (7974)

Alterations & Additions to Schools

THE BOARD OF EDUCATION OF CENTRAL SCHOOL DISTRICT NO. 1 TOWNS OF TUSTEN AND CORTLANDVILLE OF ULSTER COUNTY, NEW YORK
TOWNSEND

Separate sealed bids for General Construction Work, Heating and Ventilating Work, Plumbing Work and Electrical Work for the Alterations and Additions to the Northern Central School, Narrowsburg, New York, will be received by the Board of Education of the Central School District No. 1 of the Towns of Tusten and Cortlandville, Sullivan County, New York at the office of the Principal in the School Building at Narrowsburg, New York until 2:00 P.M. Eastern Daylight Saving Time, June 27, 1950 and then and there publicly opened and read aloud.

The Information for Bidders, Form of Bid, Form of Contract, Plans, Specifications and Proposed Bond and Bonding Requirements may be examined at the office of the Principal of the Northern Central School, Narrowsburg, New York and at the office of Hugo V. Neuhaus, Jr., Architect, 136 West 44th Street, New York, New York and copies may be obtained upon payment of $25.00 for each set. Any bidder requesting such plans and specifications must deposit with his request the sum of $25.00 for each set. Only bidders who submit bona fide proposals and who submit satisfactory financial statements will be furnished plans and specifications without charge. Bidders will be required to deposit with their bid a certified check or bank draft payable to the order of the Board of Education for an amount equal to at least five (5) percent of the amount of the bid. The Board of Education reserves the right to waive any informalities in or to reject any or all bids.

OFFICIAL PROPOSALS

Each bidder must deposit with his bid security in an amount of not less than five percentum (5%) of the Base Bid in the form and subject to the conditions provided in the Information for Bidders.

Attention of bidders is particularly called to the requirement as to minimum wage rates to be paid under the contracts.

No bidder may withdraw his bid within forty five (45) days after the actual date of the opening thereof.

CHARLES J. MAAS
President, Board of Education
June 7 and 8, 1950

Bids: June 28, 1950 (7951)

Structures, Grading, Drainage & Paving

PENNSYLVANIA TURNPIKE COMMISSION
Harrisburg, Pennsylvania

NOTICE TO BIDDERS

Sealed proposals will be received by the Pennsylvania Turnpike Commission, through the Chairman, at North Fourth Street, Harrisburg, Pennsylvania, until 10:00 A.M. Eastern Daylight Saving Time, the 20th day of June, 1950, and immediately thereafter will be taken to the Public Utility Commission's Hearing Room No. 1, North Office Building, State Capitol, Harrisburg, Pennsylvania, and immediately publicly opened and read aloud, for the following contract:

For the construction of structures and the grading, drainage and paving of Turnpike Section 21A, part of the Western Pennsylvania Turnpike Extension in Indiana and Fairman Townships, Allegheny County, Commonwealth of Pennsylvania. This section being situated as follows:

Beginning at a point approximately 360 feet East of Township Road 587 in Indiana Township at Turnpike Station 3055+70, Allegheny County, thence in an Easterly direction for a distance of 5.81 miles to a point on the right descending bank of the Youghiogheny River, Harrison Township, at Turnpike Station 3361+62, on the Turnpike Centerline, Allegheny County, a distance of approximately 5.81 miles.

The approximate quantities of the principal items are as follows:

Class 1 Excavation, 1,339,300 cubic yards; Class 2 Excavation, 22,700 cubic yards; Borrow Excavation, 35,200 cubic yards; Reinforced Concrete Pavement, 111,300 square yards; Concrete, 7,120 cubic yards; Reinforcing Bars, 750,000 pounds; Fabricated Structural Steel, 2,200,000 pounds.

Copies of plans, specifications and other information may be obtained at the office of the Secretary of the Commission, located at Harrisburg, Pennsylvania, on and after June 6, 1950. Plans, specifications and other contract documents will be available before that date at the office of the Chief Engineer, Harrisburg, Pennsylvania, for inspection only. Copies of plans, specifications and other contract documents will be available for sale to prospective bidders at the office of the Secretary of the Commission, Harrisburg, Pennsylvania, upon payment of $25.00 for each set. Bidders will be required to make a deposit of $25.00 for each set of plans, specifications and other contract documents purchased from the Commission. Deposits will be refunded to bidders who submit bona fide proposals and who submit satisfactory financial statements within ten (10) days after the date of the opening of bids. Refund will be made only for the number of sets of plans, specifications and other contract documents returned in good condition within ten (10) days after the date of the opening of bids. Refund will be made only for the number of sets of plans, specifications and other contract documents returned in good condition within ten (10) days after the date of the opening of bids.

Each bidder must deposit with his bid security in an amount of not less than five percentum (5%) of the Base Bid in the form and subject to the conditions provided in the Information for Bidders.

Attention of bidders is particularly called to the requirement as to minimum wage rates to be paid under the contracts.

No bidder may withdraw his bid within forty five (45) days after the actual date of the opening thereof.

CHARLES J. MAAS
President, Board of Education
June 7 and 8, 1950

OFFICIAL PROPOSALS

The Commission reserves the right to waive any informalities in or to reject any or all bids.

No bids may be withdrawn for thirty (30) days after the scheduled closing time for receipt of bids.

PENNSYLVANIA TURNPIKE COMMISSION
James F. Torrance
Secretary and Treasurer
Harrisburg, Pennsylvania
May 24, 1950

U. S. Government

UNITED STATES DEPARTMENT OF THE INTERIOR, Bureau of Reclamation, Sealed bids (Specifications No. 3005) will be received by Bureau of Reclamation, Upper Basin, Denver, Colorado, June 27, 1950, and then publicly opened for furnishing labor and materials and performing all work for the construction of earthwork and structures, Station 955+00 to Station 1376+50, Potholes East Canal, and North Secondary, Columbia Basin Project, Washington. The work is situated near Othello, Washington. Principal items are approximately 4,214,000 cubic yards excavation, backfill and compaction; 1,100,000 square feet lining; 1,400,000 pounds furnishing and placing reinforcement bars; 2,825 M.B.M. furnishing and erecting timber, treated and untreated; 250,000 pounds furnishing and driving steel sheet piling; and other work. Time allowed for completion will be 250 days. For particulars address Bureau of Reclamation, Ephrata, Washington, or Bureau of Reclamation, Building 53, Denver Federal Center, Denver, Colorado.

MICHAEL W. STRAUS, Commissioner
(7967)

UNITED STATES DEPARTMENT OF THE INTERIOR Bureau of Reclamation, Sealed bids (Specifications No. 2965) will be received by Bureau of Reclamation, Bismarck, North Dakota, June 22, 1950, and then publicly opened for furnishing labor and materials and performing all work for the construction of Bismarck-Dawson-Jamestown 230-kilovolt transmission lines, Missouri River Basin Project. The work is located between Bismarck, Dawson, and Jamestown, North Dakota. The work will consist of constructing foundations, steel towers, and stringing conductors and 2 overhead ground wires for a total distance of approximately 95 miles. Time allowed for completion will be 470 days. For particulars address Bureau of Reclamation, Bismarck, North Dakota, or Building 53, Denver Federal Center, Denver, Colorado.

MICHAEL W. STRAUS, Commissioner
(7966)

(Continued on page 108)

Official Proposals Columns of
ENGINEERING NEWS-RECORD

are MUST reading, each week for contractors, engineering-construction companies, equipment and materials manufacturers, all over the United States and used regularly for over 50 years by government, state, county and municipal departments to advertise bids.

Official Proposal Division
Engineering News-Record
330 West 42nd St.
New York 18, N. Y.

OFFICIAL PROPOSALS
(Continued from page 108)

Bids: July 13, 1950 (7765)

Senior High School and Recreational Facilities

TOWN OF EAST PROVIDENCE,
RHODE ISLAND

Sealed bids for the construction of the [illegible] SENIOR HIGH SCHOOL AND RECREATIONAL FACILITIES IN THE TOWN OF EAST PROVIDENCE, RHODE ISLAND, will be received at the office of the Superintendent of Schools, 590 Grove Avenue, East Providence, Rhode Island, until 7:00 o'clock P.M. (DST) on July 13, 1950, and will be publicly opened and read by the Chairman of the School Committee at 7:15 o'clock P.M. (DST) in the Library of the present Senior High School, Taunton Avenue, East Providence, Rhode Island.

The project consists in general of a three-story high school building of approximately [illegible] classrooms, cafeteria, gymnasium, swimming pool and the development of about 25 acres for the outside recreational and athletic facilities.

The contract documents, including plans and specifications, may be examined on and after July 3, 1950 at the office of Hutter, Bates, A. Maurice A. Bates, Inc., Turks Head Building, Providence, Rhode Island, and copies may be obtained upon deposit of $125.00 for each set taken. The amount of the deposit will be refunded to each person who returns the plans and documents in good condition within fifteen (15) days after the opening of bids, otherwise said deposit will be forfeited.

Bid security in the amount of 5 percent shall be submitted with each bid, subject to the conditions set forth in the Instruction to Bidders.

No bid may be withdrawn for a period of thirty (30) days subsequent to the opening of bids.

The School Committee of the Town of East Providence, Rhode Island, reserves the right to waive any informality or to reject any or all bids.

EAST PROVIDENCE SCHOOL
COMMITTEE
Francis J. Finn
Chairman

Bid: June 29, 1950 (7727)

Erection of Guard Rail

PENNSYLVANIA TURNPIKE
COMMISSION
Harrisburg, Pennsylvania
NOTICE TO BIDDERS

Sealed Proposals will be received by the Pennsylvania Turnpike Commission, through Chairman H. North Fourth Street, Harrisburg, Pennsylvania, until 10 AM., Eastern Daylight Saving Time, the 29th day of June 1950, and immediately thereafter will be taken to the Public Utility Commission Hearing Room No. 1, North Office Building, State Capitol, Harrisburg, Pennsylvania, and publicly opened and read aloud for the following contract:

For the erection of Guard Rail and construction of shoulder curbing on Sections of the Pennsylvania Turnpike, system. This work extends from a point near Middlesex, Cumberland County, Pennsylvania to a point near King of Prussia, Montgomery County, Pennsylvania, and from a point near the Lower Merion-Westmoreland County line to a point near the Interchange of Route 22 and the Pennsylvania Turnpike, Allegheny County, Commonwealth of Pennsylvania, a distance of approximately 111 miles.

The work consists of erecting and painting of the guard rail and the construction of shoulder curbing and concrete headwalls and drainage as indicated on the Contract Standard Drawings.

The approximate quantities of the principal items are as follows:

Guard Rail, Erection and Painting, 300 lin. ft. Wood Shoulder Curb, 218,000 lin. ft. Sheet Metal Inlets, 450 each, 16 GMP Shoulder Inlets, 22 each.

Information and copies of the contract documents will be on file and open to public inspection at the offices of the Pennsylvania Turnpike Commission, at Harrisburg, Pennsylvania, and Irwin, Pa. Plans and contract documents will not be available before the date the project is advertised for receipt of bids.

Bidders may obtain copies, including specifications, on and after June 15, 1950, from the Commission upon deposit of ten (10) dollars for each set requested. Checks are to be drawn to the order of the Pennsylvania Turnpike Commission. Deposits will be refunded to bidders who submit bona fide bids, upon return of documents in good condition within ten days after the date set for the opening of bids. Refund will be made

OFFICIAL PROPOSALS

for all plans and contract documents if the project is withdrawn from letting by the Pennsylvania Turnpike Commission. Requisitions are payable to the Pennsylvania Turnpike Commission and must accompany requests for mailing. Specifications and contract documents

The estimates and quantities of the various classes of work to be done, as set forth in the proposal, are approximate only and are given to all bidders on the same basis.

The Pennsylvania Turnpike Commission reserves the right to waive any informality in any or to reject any or all bids.

No bids may be withdrawn for thirty (30) days after the scheduled closing time for receipt of bids.

PENNSYLVANIA TURNPIKE
COMMISSION
James P. Furrance
Secretary and Treasurer

May 25, 1950
Harrisburg, Pennsylvania

Bids: June 21, 1950 (7741)

STATE DEPARTMENT OF PUBLIC
WORKS
BUREAU OF CONTRACTS & ACCOUNTS
ALBANY, NEW YORK

Sealed proposals will be received by Henry A. Cohn, Director, Bureau of Contracts & Accounts, 140 Elm St., The Governor Alfred E. Smith State Office Building, Albany, N.Y., until 10:30 A.M. (A.D. [illegible] Standard Time, on WEDNESDAY, JUNE 21, 1950, for projects in the following counties:

County	Deposit Bid Type	Bid Bond	Estimate
Albany	$10	$5,000	$41,000
Allegany	10	12,000	207,000
Bronx	$10	265,000	5,214,000
Cattaraugus	10	12,000	207,000
Clinton	10	6,000	98,000
Erie	15	24,000	440,000
Herkimer	10	7,000	125,000
Jefferson	10	8,000	135,000
Montgomery	15	16,000	303,000
New York	100	100,000	3,284,000
Nassau	15	24,000	440,000
Schoharie	10	14,000	260,000
Queens	15	17,000	308,000
Suffolk	100	95,000	1,729,000

OFFICIAL PROPOSALS

Sullivan	15	15,000	Bit. Mac. Pvt.	0.51	288,000
Ulster	10	25,000	Asp. Conc. Tr.	1.00	400,000
Ulster	10	3,000	Asp. Conc. Tr.	1.00	60,000
Wayne	10	3,000	Landscaping	1.00	57,000
Wayne	10	10,000	Asp. Conc. Tr.	5.00	175,000

Maps, plans, specifications and estimates may be obtained at the Office of the Department of Public Works, Bureau of Contracts and Accounts, Albany, N. Y., and at the office of the District Engineers in whose district the roads are located. The name and address of the District Engineers will be furnished on request, and may be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for Plans and Proposal Forms for each contract is indicated. A refund will be made in full to bidders for returns of one set in good condition within 30 days of award, or rejection of bids; refund for all other sets in good condition, similar period will be [illegible] deposit.

Special attention is called to [illegible] Information for Bidders, to the [illegible] specifications, and [illegible] agreement, and to the special provisions applying to projects financed with federal funds.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside, and must be accompanied by a certified check payable to the order of State of New York, Comptroller of Taxation & Finance, for the sum specified in the advertisement and the proposal. The retention and disposal of the bids, the execution of the contract and bonds are subject to Section 138 of the State Finance Law and to Section 72 of the Highway Law. When optional types are permitted on contracts with federal funds, bidders must state in the space provided in the proposal the exact designation of the optional type upon which the proposal is predicated.

The right is reserved to reject any or all bids.

B. D. TALLAMY
Supt. of Public Works

U. S. Government

UNITED STATES DEPARTMENT OF THE INTERIOR, Bureau of Reclamation, Sealed bids (specifications of which will be on file in the office of Bureau of Reclamation, Trenton, Nebraska, and their public opened for furnishing labor and materials and performing all work for the completion of Trenton Dam, Frenchman-Cambridge Division, Nebraska, Missouri River Basin Project. The work is situated on the Republican River about 3 miles west of Trenton, Nebr., on U.S. Highway No. 34, and about the head of [illegible] main Principal items of construction are: 2,250,000 cu. yds. [illegible] excavation; 1,450,000 cu. yds. [illegible] excavation; 2,100,000 cu. yds. earth fill and embankment; 1,200,000 pounds reinforcing steel; 206,500 cu. yds. riprap; 1,000,000 pounds reinforcement bars; 1,000 lin. ft. sewer pipe; and other work. Time allowed for completion will be 1,000 days. For particular address Bureau of Reclamation, Trenton, Nebraska, or Building 1A, Denver Federal Center, Denver, Colorado.

MICHAEL W. STEARNS, Commissioner

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NEW ADVERTISEMENTS received by June 12th at the New York Office 330 W. 42 St., N. Y. 18, will appear in June 22nd issue subject to space available

ESTIMATOR—Wanted

Growing concern, doing building, sewer, road and general construction in Ohio. Experienced man preferred, permanent position. State qualifications, exp., age, former employer, references, salary expected, first letter.

P-6222, Engineering News-Record, 330 W. 42nd St., New York 18, N. Y.

CONTRACTING ENGINEER
STRUCTURAL STEEL

Long established steel fabricating plant in New England has an opening, due to promotions, for a man with experience in estimating and selling structural steel and miscellaneous iron work.

He must have personal qualifications and sufficient experience to enable him to take charge of these departments.

Submit complete resume in strict confidence.

SW-6788, Engineering News-Record, 330 W. 42nd St., New York 18, N. Y.

ESTIMATOR

Wanted by established Pittsburgh firm of commercial and industrial contractors. Must have had experience with contractors engaged in similar work. State salary, experience and when available. Splendid opportunity for advancement.

P-6190, Engineering News-Record, 330 W. 42nd St., New York 18, N. Y.

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P-6196, Engineering News-Record, 330 W. 42nd Street, New York 18, N. Y.

GRAVEL PLANT SUPERINTENDENT

Wanted for operating and managing portable and permanent plants in Indiana and Michigan. State experience, references and salary.

P-6206, Engineering News-Record, 520 N. Michigan Ave., Chicago 11, Ill.

BOLT and NUT SALESMAN

Heavy Hardware Manufacturing Company offers position to salesman experienced in contacting general contractors.

SW-6749, Engineering News-Record, 330 W. 42nd St., New York 18, N. Y.

FENCE AGENCY
AVAILABLE

National Chain Link Fence Manufacturer has agency opening. Experienced fence man preferred.

RW-6693, Engineering News-Record, 330 W. 42nd St., New York 18, N. Y.

REPLIES (Box No.): Address to office nearest you
NEW YORK, 330 W. 42nd St. (18)
CHICAGO, 520 N. Michigan Ave. (11)
SAN FRANCISCO, 68 Post St. (4)

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CONSTRUCTION COMPANY, operating nationwide, specializing in structural concrete, such as bridge piers and their foundations and mass concrete, such as dams, requires New York construction engineer and estimator capable of planning and layout, including forms, and economical handling of materials. To the right selected, complete charge of operations will be turned over; organization has been allowed for in advertised salary. P-6251, Engineering News-Record.

CIVIL, MAT. Draftsmen and Computors. Metropolitan New York. P-6241, Engineering News-Record.

CONTRACTORS ENGINEER. Technical graduate between 25 and 35 with experience in construction and estimating for building construction. Knowledge of brick masonry desirable. Excellent opportunity with nationally operating engineering contracting organization. Salary commensurate with ability. Write fully and furnish recent photograph in first letter. P-6229, Engineering News-Record.

STRUCTURAL STEEL and Ornamental Iron Shop Superintendent wanted for shop in Northern New Jersey. Must have had shop superintendent who can handle men and get out production. Permanent position. Reply stating salary desired. P-6252, Engineering News-Record.

INSTRUCTOR in Engineering Mechanics and Engineering Drawing. Graduate engineer with teaching experience. Permanent position in well-established college in New England. P-6232, Engineering News-Record.

ENGINEERING ASSISTANT Draftsman. Graduate engineer or equivalent. Thoroughly experienced in concrete and steel design and detailing. Must be capable of handling work under supervision of Senior Engineer. Salary commensurate with ability. Permanent position with progressive firm. Write Box 1, Plant Maintenance & Engineering, 1014 Wyandotte, Kansas City, Mo.

ENGINEERS, Architects, Draftsmen. Permanent positions with well-established firm located in Northern New Jersey. Write fully, stating experience, salary desired, etc. P-6247, Engineering News-Record.

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SALES REPRESENTATIVE wanted to sell a line of [illegible] to the Engineering and Contracting trade. Territory is [illegible] Excellent opportunity for a man who is now selling to the RR trade. Write Box 1, Plant Maintenance & Engineering, 1014 Wyandotte, Kansas City, Mo.

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ENGINEERS, DRAFTSMEN, Designers, Supervisors, Estimators, Superintendents, Chemists, Metallurgists, Geologists, Draftsmen, Technicians, Instrumentmen, Engineering Aides, Inspectors, Tracers, Detailers, Engineering Executives, Sales Engineers, Field Engineers, Metallurgical Engineers, Chemical Engineers, Mechanical Engineers, Electrical Engineers, Civil Engineers, Structural Engineers, Mining Engineers, Industrial Engineers, Petroleum Engineers, Ceramic Engineers

POSITIONS WANTED

(Continued from the opposite page)

CONSTRUCTION MGR. desires connection. Under all forms of contract. Heavy and light. Age 37, married, college graduate. Salary $12,000 year. PW-6711, Engineering News-Record.

PROJECT MANAGER, civil engineering graduate, available immediately for position. 5 years experience supervising construction of industrial plants, including foundations, steel and concrete erection, piping and mechanical equipment. Will travel. PW-6741, Engineering News-Record.

ESTIMATOR, ENGINEER, graduate civil engineer, 10 years experience in general contracting, heavy construction, industrial and commercial buildings. Desires permanent connection with progressive organization. Will travel. PW-6751, Engineering News-Record.

GENERAL SUPERINTENDENT, 20 years experience, heavy construction, industrial and commercial buildings, bridges, dams, tunnels, marine work, reinforced concrete, piling, etc. Desires permanent connection. Will travel. PW-6761, Engineering News-Record.

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ENGINEER, SKILLED in cost, design, layout, construction, estimating, specifications, contracts, and supervision, Registered, Location, Philadelphia area preferred. Box 1001, Philadelphia 5, Pa.

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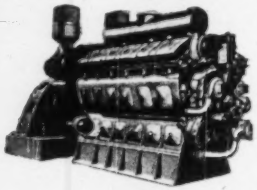

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1250	General Motors	16-278A	1600	720	312	General Motors	8-268A	450	1200
937.5	General Motors	12-567	1080	720	312	Clark	SH14	375	327
625	Mco	6-12 tgXSF	750	600	165	General Motors	3-268A	150	1200
125	Baldwin	V346	510	450	75	General Motors	6046C	90	1200
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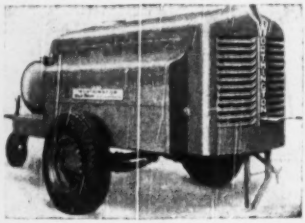

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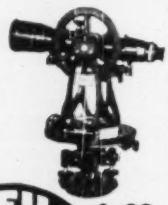

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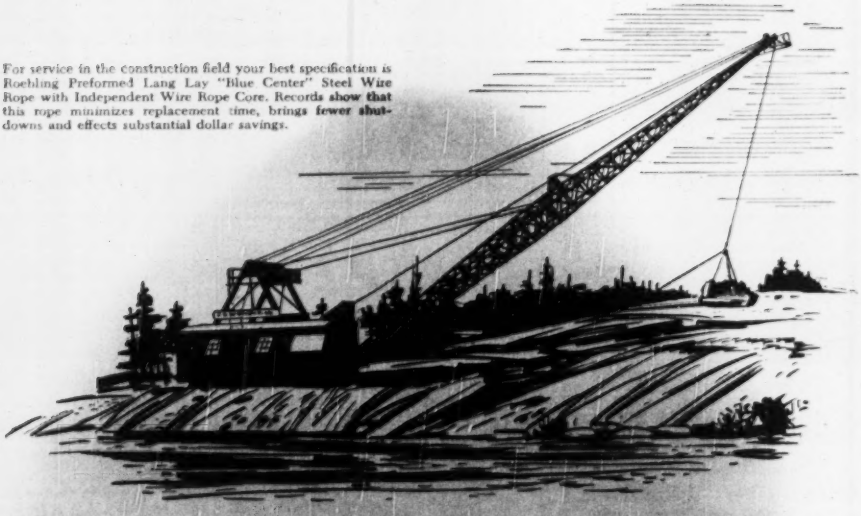
QUICK solutions to your technical problems are available through these consultants. Think first of the Professional Services Section of your publication when considering calling in an expert.

For service in the construction field your best specification is Roebling Preformed Lang Lay "Blue Center" Steel Wire Rope with Independent Wire Rope Core. Records show that this rope minimizes replacement time, brings fewer shutdowns and effects substantial dollar savings.



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YOU WANT ROPE that's *extra* tough, *extra* long-lived! And you *get* these extras in Roebling Preformed "Blue Center" Wire Rope, for "Blue Center" steel has completely superior resistance to abrasion, shock and fatigue. Roebling developed and is the only maker of "Blue Center" steel . . . and Roebling research, workmanship and modern, precision machines are your added assurance of rope quality that pays off.

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There's a Roebling wire rope of the right construction, grade and size for every type and make of rope-rigged equipment. Have your Roebling Field Man tell you which rope will give the best and the lowest-cost performance for every installation. John A. Roebling's Sons Company, Trenton 2, New Jersey.

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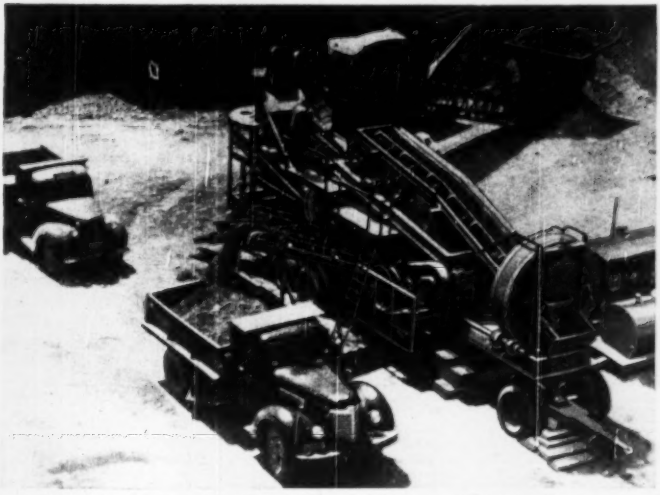
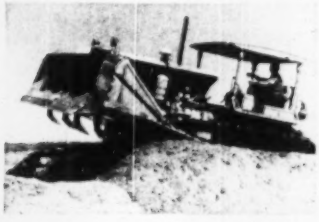
NEW PRODUCTS



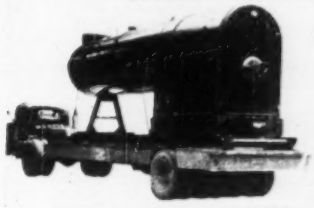
Portable Gravel Plant Features Three Crushing Stages

PRE-SCREENING operation on the TwinDual Gravel-King sizes and removes natural sand and gravel. Large boulders are scalped to the large-opening primary. Material requiring secondary reduction is by-passed to the TwinDual roll crusher for second and third stages of crushing. One-hundred-percent chips can be produced, or finished material from the scalping screen blended with crushed material from the plant. This plant is designed for field conversion to quarry operation. An apron feeder is interchangeable with scalping screen for quarry rock. The Gravel-King is made in two sizes—the Junior has an 18×24 roller-bearing jaw crusher, 24-in. TwinDual roll secondary, 5×8-ft 2½-deck gyrating screen, 5×6-ft 2-deck gyrating scalping screen, and swivel-feed conveyor; the Senior has 20×36 roller-bearing jaw crusher, 30-in. TwinDual roll secondary, 4×10-ft 2½-deck gyrating screen, 4×10-ft 2-deck gyrating scalping screen, and swivel-feed conveyor. Complete plant operates from one power unit.—UNIVERSAL ENGINEERING CORP., DIV. PETTIBONE MULLIKEN CORP., CEDAR RAPIDS, IOWA.



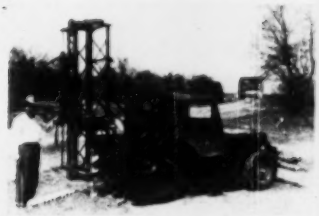
Back-Rip Scarifiers

Teeth mounted on back side of bulldozer moldboard rip ground when tractor backs up. The Back-Rip scarifiers float on top of ground as tractor moves forward. Uses for the teeth include: Rip and loosen packed soil, black top, and hard ground; take out rocks and roots, making forward blading easier and faster; and eliminate deadhead time. Set consists of four curved-shank, capped, locked-on replaceable teeth mounted in housing welded to back of moldboard. Teeth can be raised and pinned out of way when not in use.—PRECO, INC., 6300 E. SLAUSON AVE., LOS ANGELES 22, CALIF.



Boiler for Asphalt Plants

Portable 104-hp boiler, designed for working pressures up to 150 psi, is especially recommended for use in conjunction with asphalt plants. The Lucey 104 features a 1,040-sq-ft heating surface, a 160-ft furnace volume, steam volume of 54 ft, and an oversized seamless firebox. The boiler is adaptable for oil, gas, or stoker firing, and may be skid-mounted for portability. The 30-in.-dia stack is 28 ft long. Additional sections are optional. The unit measures 22 ft 6 in. x 6 2 in. x 7 ft 6 in., and weighs 18,000 lb.—Lucey Boiler & Mfg. Corp., 1516 Chestnut St., Chattanooga, Tenn.



Jeep-Mounted Drill

Lightweight drill (Model B35) augers holes with 3- to 12-in. dia. It is supplied complete with all equipment for adaptation to a Jeep, truck, or tractor power-take-off. Among recommended uses are: Soil testing, augering post holes, locating bridge foundations, drilling shallow wells, drilling borrow pits, and locating mineral beds. In vertical position, with 4-in. tools it will auger to depths of 100 ft without the use of water. A mobile turntable converts the B35 to a horizontal drill. Feed is hydraulic.—MOBILE DRILLING, INC., 960 N. PENNSYLVANIA ST., INDIANAPOLIS 4, IND.

Saw Pump Operates Dry

Factory-sealed water pump on Model HD wet-or-dry masonry saw eliminates the necessity for disconnecting pump when cutting dry. To switch from wet to dry cutting, the operator turns a pet cock on the outlet of the pump. Company reports the pump can not be damaged by dry cutting. No maintenance is necessary as a factory exchange plan is set up to handle any difficulty. The Clipper saw handles all masonry materials from 12-in. concrete block to 4-in. quarry tile.—CLIPPER MFG. CO., DEPT. ENR, 2800 WARWICK TRAFFY, KANSAS CITY 8, MO.

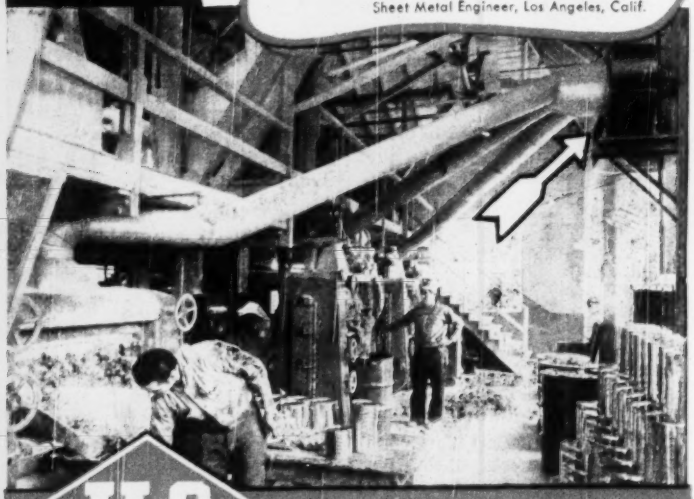
Improved Dumpcrete

Job-tested Dumpcrete improvements include: Swinging baffle inside body has been increased in overall height and relocated to improve dis-

(Continued on next page)

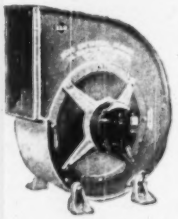
"I strongly recommend ILG equipment"

Mr. A. W. Gutridge
Sheet Metal Engineer, Los Angeles, Calif.



ILG VENTILATION

Over ten years ago, Mr. Gutridge recommended an ILG Centrifugal Fan to the W. P. Fuller Paint Company of Los Angeles for removal of fumes from paint mixers (above). The exhaust system engineered by Mr. Gutridge is still on the job today, providing Fuller employees with a clear, cool, fresh atmosphere. That's proof that ILG *pays-off in performance!* And that's why Mr. Gutridge has always "strongly recommended ILG equipment wherever possible." Whatever *your* ventilation problem, there is ILG equipment "custom-built" to your specifications . . . capacity-wise, price-wise. Call nearby ILG branch office (consult classified directory) or send coupon today for FREE BOOKLET.



ILG Direct-Connected Centrifugal Fan . . . saves one-third on space, 25% on installation and maintenance, 10 to 15% on power costs.

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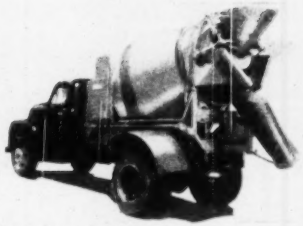
charge action; gate wings are built higher with longer slope to permit faster, easier unloading, and sides of hopper section chute have been increased to eliminate concrete overflow. Swingaway-type chute has been added to the 4-yd body. For driver convenience, strap steps are provided on front and rear running boards, and gate discharge handles are more easily accessible.—Maxon Construction Co., Dumpcrete Div., 131 N. Ludlow St., Dayton 2, Ohio.



Reduced-Weight Truck Mixers

Loadlimit Smith-Mobiles haul full-rated truck-mixer payloads while meeting highway load limitations imposed by most states. Reduced weight is accomplished through elimination of parts and assemblies which are not basic or necessary to mixer operation. Loadlimit model can be quickly changed to a standard truck mixer or agitator; or, a standard model can easily be converted to a Loadlimit model. The new machines are available in 2, 3, 4½, and 5½-yd sizes.—The T. L. Smith Co., 2851a N. 32nd St., Milwaukee 10, Wis.

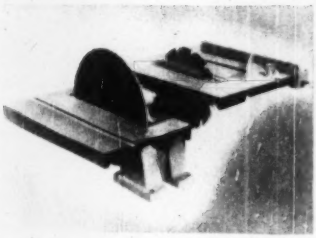
Lightweight Belt Conveyor

Aluminum power belt conveyor is available in five standard lengths from 11 to 21 ft with 10 or 16-in. belt widths. The Stevedore, Jr., operates horizontally or at any angle up to 40 deg. Two-way belt travel permits use in loading and unloading operations. Unit is available with cushion-rubber or pneumatic-tired wheels.—Grand Rapids Standard Co., Inc., Dept. ASJ, 342 Rapidstan Bldg., Grand Rapids 2, Mich.

Carbon-Dioxide Producer

Carbonization of lime-softened drinking water is simplified by modern unit for producing and diffusing carbon dioxide into water. Gas formed by Carball unit is diffused by a Diffusair unit, said to insure 95% absorption and to eliminate clogging and

corrosion troubles. Burner receives fuel and air under pressure so that gases leaving the producer are under sufficient pressure for self injection. Complete safety devices are provided to shut unit down and sound alarm in case of flame failure, excess water temperature, or other unsafe condition. Units are available with capacities ranging from 20 to 576 lb of carbon dioxide per hour.—Walker Progress Equipment, Inc., 518 Hankes Ave., Aurora, Ill.



Bench Saw; Disk Sander

Combination 8-in. bench saw and 9-in. disk sander has a ripping fence, miter slide, and both tables tiltable from 0 to 45 deg. Saw table is adjustable in height for dado work and either table can be removed entirely for mounting accessories. Over-all dimensions are 21x13¾x12 in.; weight is 16 lb.—Duo Master Industries, 242 Rowe Bldg., Sparta, Mich.

New Product Briefs

Expanded diesel-engine line now includes five 4-cyl models and six 6-cyl models ranging in output from 90 to 200 hp. Refinements in design of these engines are said to provide more power, greater economy and dependability, and longer life. Maker: Murphy Diesel Co., Milwaukee 14, Wis.

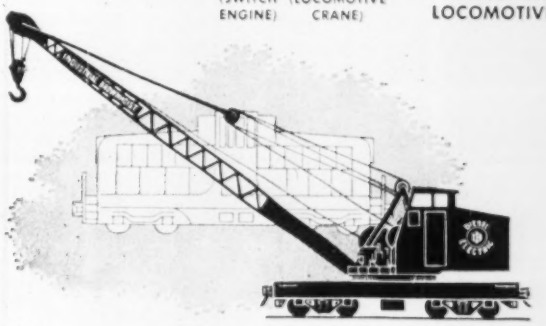
Damp-resistant product for coating interior of exterior masonry walls is a non-fibrated liquid asphalt compound, free of coal tar. Plasterbond dries with a tacky, elastic film that permits plastering after 24 hr. Foundation Coating resists seepage of underground moisture through exterior masonry or concrete walls below grade. Both products can be applied by brush or spraying. Maker: The Philip Carey Mfg. Co., Cincinnati 15, Ohio.

Mobile transmitter-receiver is designed for adjacent channel operation in urban and metropolitan areas. Said to improve performance of the crowded radio-frequency spectrum, it consists of a 10-w transmitter, receiver, and power supply in one cabinet. Maker: General Electric Co., Syracuse, N. Y.

NEW ARITHMETIC FOR COST MINDED EXECUTIVES:

1 + 1 = 1 BROWNHOIST

(SWITCH ENGINE) (LOCOMOTIVE CRANE) DIESEL ELECTRIC LOCOMOTIVE-CRANE

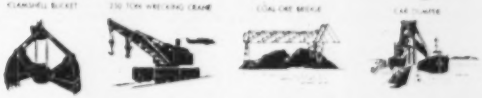


Two big pieces of material handling equipment in one — that's what you get in the Brownhoist Diesel Electric Locomotive-Crane — a heavy-duty switch engine, and a powerful locomotive crane of 30 tons capacity, and up.

New clear-vision boom design allows operator an unobstructed view through the lower end of the boom, an area that is a blind spot on many cranes.

And the Monitor-type cab assures 360° visibility from the operator's position. Safety engineered design gives 14" clearance between revolving upper work and car body.

Write today for more complete information.

BROWNHOIST BUILDS BETTER CRANES

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ENGINEERS and CONTRACTORS . . . WEATHERPROOFING SPECIALISTS

MANUFACTURERS' PUBLICATIONS

Electric Sump Pumps—All-bronze electric sump pumps for pit depths to 3 ft are described in Leaflet 3250. This bulletin covers hourly drainage capacities, construction, displacement-type control, power unit, and dimensions of the "Dram-Dri" line.—YEOMANS BROS. CO., 1445 N. DAYTON ST., CHICAGO 22, ILL.

Baseboard Heating—Theory of operation, design, and installation of radiant baseboard heating is explained in this 34-p catalog. Feature of the catalog is the use of large photographs showing typical installations, and schematic drawings indicating the how and why of radiant heating.—UNITED STATES RADIATOR CORP., 300 BEMIS BLDG., DETROIT, MICH.

Duraplastic Concrete—Origin, development, and applications of Duraplastic air-entraining cement is traced in a 20-p catalog. This catalog plays down technical details and accentuates pictorial presentation. More than fifty typical installations made during the past decade are illustrated and captioned to emphasize the advantages and results claimed for this cement in making durable concrete.—UNIVERSAL ATLAS CEMENT CO., 723 CHRYSLER BLDG., NEW YORK 17, N. Y.

Electric Generator Sets—Pamphlet describes different uses for independent electric generating sets. The various types and sizes available, and the purposes for which they are best suited, are listed.—UNIVERSAL MOTOR CO., 413 UNIVERSAL DRIVE, OSHKOSH, WIS.

Concrete Inserts—Bulletin (4 pp) describes advantages of Unistrut concrete inserts. Bulletin CI-2 emphasizes the fact that these inserts permit attachment of fittings at any point along the insert line without disturbing attachments previously made. Complete specifications and ordering information are included.—UNISTRUT PRODUCTS CO., 1013 W. WASHINGTON ST., CHICAGO 7, ILL.

Form Clamps and Ties—Revised specifications for form clamps and ties for architectural concrete are available in printed form. These set forth amount of "disconnection" recommended for exposed or non-exposed surfaces; types of spacers; new type of aligners and anchors; and wale-supports and their value in holding forms to alignment. The specifications list recommended factor of safety for ties over actual estimated pressure because of severe and unexpected conditions of impact and vibration, as well as unusual head of concrete over average rate of fill.—WILLIAMS FORM ENGINEERING CORP., 1501 MADISON AVE., S. E., GRAND RAPIDS 7, MICH.

Cast-Iron Pulleys—Complete line of Blue-Face cast-iron pulleys is listed and described in 16-p Bulletin 33. Table of contents on front cover facilitates quick reference. Supplementary Bulletin 35 carries case histories of installations of the Belt-Saver tail pulley for bucket elevators and belt conveyors. Pulley is furnished in diameter sizes from 6 to 40 in.—SPROUT-WALDRON & CO., INC., MUNCY, PA.

Drafting-Room Equipment—Data sheet lists a steel 4-post drafting table and an all-steel portable tracing board. The table is available with shallow and tool drawer, without drawers, with tool drawer only, and with shallow drawer, tool drawer, and auxiliary 2-drawer unit. Each style is illustrated on the data sheet. Prices are listed for each style in the various sizes in which they are available.—STACOR EQUIPMENT CORP., 1857 ATLANTIC AVE., BROOKLYN 33, N. Y.

Surveying Equipment—Pocket-size folder describes a complete line of surveying instruments. Items listed include precision steel tapes, pocket tapes, frame tapes, oil-gaging tapes, plumb bobs, tape hooks, tape wipers, speed tapes, transits and leveling instruments, targets and plumb bobs, and draftsmen's tools.—THE L. S. STARRETT CO., ATHOL, MASS.

Conveyor Magazine—Copies of The S-A Conveyor are available free to those interested in conveyor operation. Published quarterly, this magazine contains interesting articles dealing with job applications of various types of conveyors. The magazine also contains information on proper handling and maintenance of these units.—STEPHENS-ADAMSON MFG. CO., AURORA, ILL.

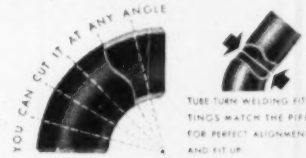
I-H Catalogs—Three new catalogs are announced by the International Harvester Co. Form A-419-NN describes pipeline construction using the TD-24 and other industrial tractors of the 12 model International line. This bulletin, Form A-420-ML, entitled, "Is Your Horsepower Going to the Track?", lists performance-boosting and cost-cutting features of International crawler tractors. Form A-419-

(Continued on page 127)

HOW TO SIMPLIFY ODD-ANGLE PIPING

The ease with which pipe can be installed at odd angles for compactness is an important reason for the widespread preference for Tube-Turn Welding Fittings.

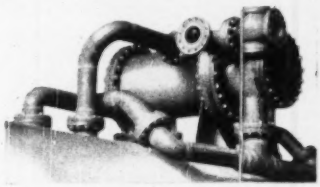
For example, one of the country's leading consulting engineers (name upon request) states: "We employ a great number of experienced welders in all parts of the country. They all prefer Tube-Turn Welding Fittings because many of the fittings we use must be cut to odd angles. When lining up the fittings, cutting them and placing them into the line, our welders say they are more



sure of accurate alignment and fit-up with Tube-Turn Welding Fittings than with any other make."

There's good sound reason behind this preference. Tube-Turn Welding Elbows and Returns are formed to give you *true circularity . . . accurate curvatures and center-to-face dimensions . . .* and *absolute uniformity of wall thickness. Hence, you can cut a Tube-Turn Welding Elbow or Return to any odd angle required and it will line up perfectly with the pipe.*

Tube-Turn Welding Fittings are available in a *complete range of sizes, shapes and materials.* For speed, simplicity and versatility in piping installations, be sure you get *genuine* Tube-Turn Welding Fittings.



Tube-Turn Welding Fittings simplify the fabrication of intricate piping system designs such as the installation shown above. Their true circularity and uniform wall thickness permit cutting and welding them at any odd angle.

FREE BOOKLET

Write for your free copy of "Allowable Working Pressures." It contains valuable information on Power Piping, Oil Piping, District Heating Piping, Gas and Air Piping and Refrigeration Piping.

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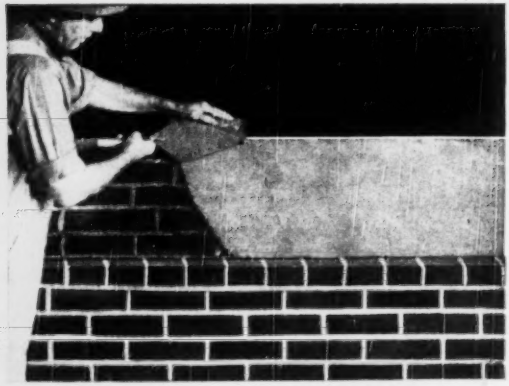
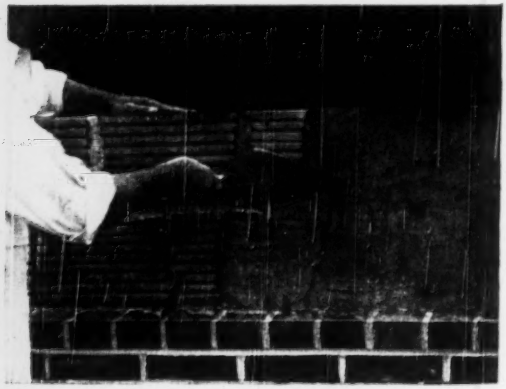


The face brick should be backplastered.



If the back-up units are laid first, the front of the back-up units should be plastered.

Backplastering should not be attempted over protruding mortar joints.

PARGING

WITH

BRIXMENT

HELPS ASSURE

DRY WALLS

WE SUGGEST THAT—

The face brick should be backplastered with not less than ⅜ of an inch of mortar before the back-up units are laid.

Or, if the back-up units are laid first, the front of the back-up units should be plastered with not less than ⅜ of an inch of mortar before the face brick are laid.

Heavy rains don't make brick walls leak — they merely reveal the fact that the walls contain voids or passages through which the water may penetrate.

Dry brick walls are primarily the result of good design and good workmanship. Good materials are important, but still secondary. The more *plastic* the mortar used, the easier it is for the bricklayer to deliver good workmanship.

The photos at the left show some points of *good workmanship.*

Brixment mortar has greater plasticity, higher water-retaining capacity and better bonding quality. Because of this *combination* of advantages, architects, contractors and dealers all over America have for thirty years made Brixment the largest-selling mortar material on the market. Why not try it yourself?

LOUISVILLE CEMENT COMPANY, Incorporated, LOUISVILLE, KENTUCKY

(Continued from page 124)

MM describes 3-point track suspension, and function of the front stabilizer. It is entitled, "How Long Is Your Tractor's Life Line?"—INTERNATIONAL HARVESTER CO., 180 N. MICHIGAN AVE., CHICAGO 1, ILL.

Testing Machines—Catalog RC 2-50 covers hydraulic compression testing machines and other equipment for testing concrete, brick, tile and other construction materials. Catalog RU 3-50 describes the Model MX universal hydraulic testing machines. Both are profusely illustrated and include details of construction, specifications and dimensions.—RIEHLE TESTING MACHINES DIV., AMERICAN MACHINE & METALS, INC., EAST MOLINE, ILL.

Lighting Fixtures—Sectionalized catalog lists complete line of slimline and fluorescent fixtures. Fluorescent spotlights and incandescent Display O-Lites are also featured. The catalog contains pictures, descriptive material, engineering data, photometric data, and recommended uses of all Pholite products listed.—RUBY-PHOLITE CORP., 52-02 QUEENS BLVD., LONG ISLAND CITY 1, N. Y.

Sewage-Sludge Dewaterer—Outstanding advantages claimed for the Oliver sewage-sludge dewaterer are listed in Bulletin 219. Features of construction and operation of this unit are described. General data listed on the final page cover standard sizes.—OLIVER UNITED FILTERS, INC., 33 W. 42ND ST., NEW YORK, N. Y.

Residential Panel Construction—Simplified method of erecting small residential panels of glass blocks is described in new booklet, "Beauty Spots for Your Home." Method described eliminates structural accessories such as wall ties, expansion joints, and wall anchors. Panels erected must be 25 sq. ft. or less in area, and have a height of no more than 7 ft. or a width of no more than 5 ft.—PITTSBURGH CORNING CORP., 307 FOURTH AVE., PITTSBURGH 22, PA.

Asphalt Plants—Complete line of White asphalt plants is described in Circular 50. This circular describes portable pavement repair trucks with capacities to 10 tons per hr.; moderate-size asphalt paving plants with capacities to 30 tons per hr.; large models equipped with vibrating separation screens, multi-compartment hot-storage bins, dust collectors, and either volumetric control or weigh scales. Also described are separate units of aggregate dryers and pug-mill mixers.—WHITE MFG. CO., ELKHART, IND.

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Confusion in San Francisco

The sign on the door on the second floor of 74 New Montgomery St., read "Division of San Francisco Bay Toll Crossings, California Department of Public Works," but quite obviously, no toll crossing business was being done.

"Come in," said the man with his coat off. He sat on an odd-shaped crate, nailing it shut with quick, savage blows of the hammer. "Come in and watch the burial of San Francisco's hopes for a new Bay crossing. The sad part is, they're dead and San Franciscans—the people most concerned—don't suspect it."

"You want to see Ralph Tudor, our chief engineer, I suppose. As usual, he's at a hearing, explaining the plan for a second Bay Bridge before some local politico more interested in headlines than in information. Mr. Tudor spends most of his time that way these days. He's very philosophical about it—says it's a politician's duty to find out if engineers know what they're talking about. Frankly, I don't think they can.

"You want to know why? Take this box I'm sitting on. It contains one of the elaborate set of models that we made, showing just how the approaches to a new Bay Bridge parallel to the existing one would collect and distribute the traffic in downtown San Francisco. Such approaches would also have given the city a group of elevated highways that would have taken a lot of traffic off the streets, traffic that merely wanted to move more freely from one part of the business district to another.

"Do the politicians want to understand this? They do not. They tell the people that a parallel bridge will disgorge new streams of vehicles into an area already jammed with traffic. They claim they want a crossing farther south. The fact that the motorists now crowding the present Bay Bridge to the danger point won't travel 5 miles out of their way to use a bridge farther south is disregarded. The important point is that the solution to the traffic jams in the downtown area is now being crated away in these boxes, as is the key to successful relief of the congested Bay Bridge.

"Even our Congressmen in Washington are parties to this confusion. The federal government is involved because it helped finance the existing bridge and owns some of the needed new right-of-way. Senator Knowland introduced bills to get necessary federal right-of-way across Yerba Buena Island and to permit continued collection of tolls on the existing bridge to help pay for the new one. And then Senator Downey opposed the bills, as did several California Congressmen. Add an expressed preference for a southern crossing by the Department of Defense, and San Francisco's chances for a new Bay crossing are completely and thoroughly fouled up.

"You think this is just sour grapes, that I and all the rest of these guys around here are sore because we're out of a job? You're wrong. We've already got other jobs—go to work just as soon as we clean up this mess around here. Sure, we're sorry to break camp, to see a fine engineering organization disbanded, but we're more sorry to see the people of San Francisco getting a raw deal.

"Here's how raw it is:

"A southern crossing can't be financed until sometime in the future, and then only with higher tolls, but the citizens are led to believe otherwise.

"A parallel bridge will readily pay for itself, but the citizens are told that it will make traffic congestion worse in the downtown section of San Francisco.

"Actually the approaches designed to handle the traffic from the old and a new bridge would distribute this traffic widely, and in addition would furnish an elevated express system for strictly intra-city traffic, but the citizens are told that it would be prohibitive in cost and too complicated to be efficient.

"Postponing the building of a second Bay Bridge is held up as a great victory, but the citizens are not told that the prospects for financing any type of new crossing will be pretty thin if the present bridge should become toll free in the meantime. At the present rate of amortization, that could happen within three years.

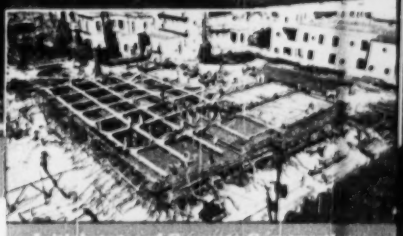
"And the mirage of great fills across the Bay, called the Reber Plan, is being allowed to cloud the issue, when numerous engineering studies have pointed to its impracticability as well as to its exorbitant cost.

"Pretty discouraging, isn't it? Maybe a group of public-spirited citizens, who know what's what, could revive the parallel bridge plan by taking the leadership and permitting the local politicians to save face. They are out on a limb with their advocacy of an impracticable southern crossing, but they can't back down gracefully. You see, the parallel bridge would be a state project, and they are politically opposed to the state administration. This lack of all logic, since a southern crossing, or any other crossing of the Bay, would have to be a state project; but logic is not a characteristic of politics. A citizen's committee is about the only hope.

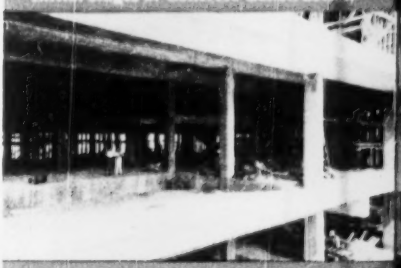
"The East Bay cities? Well, the principal ones are for the parallel bridge and want the approaches that have been designed to go along with it. But that isn't much help. San Francisco is usually at political loggerheads with Oakland and Alameda, and what they like over there is looked at with suspicion over here. Sort of a fear that some day San Francisco will be the suburb, I guess. It might, too, if it doesn't solve the problem of congestion on this Bay Bridge.

"Sorry if I detained you, but you looked like you would be willing to listen. I was tired nailing these damn boxes anyway. I use a side rule better than a hammer. Come back tomorrow, maybe Mr. Tudor will not have a hearing to go to. But don't wait too long. This office won't be here after June 30."

Radio Centro, Habana, Cuba. Architects: Junco, Gastón y Domínguez. Contractors: Purdy and Henderson. Structural Design: Ing. José A. Vila. Supt.: Ing. Bartolo Bestard. Pozzolith Concrete: Concretera Nacional, S.A.



Initial stages of Concrete Construction



Detail — Promenade and Shops

Office Bldg., foreground; Radio Studios, right background; Theater, left background.

Havana's Largest Concrete Structure built with POZZOLITH

Havana's Radio Center — largest concrete structure built to date in Cuba's capital — is another example of Pozzolith's around-the-world use, which includes Canada, Central and South America, Philippine Islands, Puerto Rico, Hawaiian Islands, Arabia, Africa as well as all parts of this country. Among the advantages obtained on this job with Pozzolith, cement dispersion:

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CLEVELAND 3, OHIO TORONTO, ONTARIO

NORTH CAROLINA

(left) For this farm-to-market road, a plant-mixed Texaco Sand Asphalt wearing surface was laid over a sand-clay base.

MASSACHUSETTS

(right) A Texaco Asphalt Macadam pavement was constructed on a 12-inch gravel sub-base and 4½-inch sand-filled stone base for this superhighway near Concord.

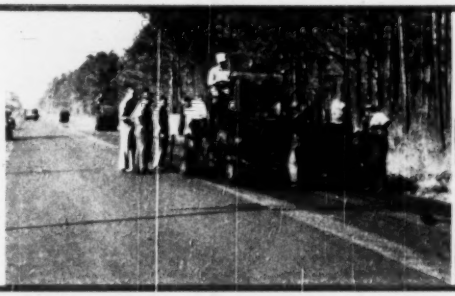
When highway "specs" call for Asphalt - -

FLORIDA

(right) Heavy-duty Texaco Asphaltic Concrete paving was used to widen and resurface 16½ miles of U. S. Route 1 near Jacksonville.

MINNESOTA

(left) Constructing a plant-mixed Texaco Asphalt pavement on 14 miles of State Highway 15, using pit-run gravel as aggregate.



roadbuilders the country over choose Texaco

TEXAS

(left) Texaco Asphaltic Concrete paving plays important part in this State's program for by-passing traffic around the city of Austin.

SOUTH DAKOTA

(right) A 4-inch Texaco Sand Asphalt pavement is supported by a 6-inch stabilized sand-clay base on this section of U. S. Route 18.

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